---Index to Contents, May, 1938---

The Annual Index for each volume appears on the last eight pages of the December issue

Airports
Municipal Airport Problems ... 77

Business and Industry
Wise Public Spending Involves Careful Planning ... 37
The Tax System and Industrial Development 83

Business Machines
Mechanized Accounting Aids for Municipal Utilities ... 43

City Manager Plan
Lexington, Va., 455th Council-Manager City 101

Civic Organizations
Civic Club Makes Success of Abandoned Private and Municipal Projects ... 93

Conventions
When and Where ... 113

Disaster Relief
Tornado Relief, Radio-Controlled ... 48
Los Angeles "Disaster Plan" ... 101

Finance and Taxation
Salaries of Councilmen ... 5
Household Furnishings Going Off Tax Lists. 54
Must a City Pay Federal Sales Taxes? ... 59
The Tax System and Industrial Development 83
The Municipal Bond Market ... 95
19 States Extend Tax Exemptions on Manufacturing Machinery ... 101

Fire Prevention and Control
Year's Work of the Biggest Diesel Fireboat 15
New Orleans Will Improve Fire Department 15
Chief Tell Radio Public About Fires ... 15
Building Plans for Duluth Firemen ... 15
Nine-Men Cab on Chicago's New Pumpers. 79
A Fire Station, Clinton, Iowa ... 95

Forward Steps
Items Contributed by Officials and Others. 91

Government and Administration
Forms of Municipal Government ... 5
The Decennial Institute of Government ... 75
A High-School Project in City Government. 93
A City Hall, Clinton, Iowa ... 95
Parks Steadily Improving as Cities Stress Planning Aspects ... 101
National Governmental Organizations in Chicago Move to New Building ... 101

Health
Water-Borne Disease in the United States .. 13
Mosquito Control by Dusting from Airplanes ... 13
Tractor and Mower, Hinsdale, Ill. ... 13
Clean Flushed Streets Aid Community Health ... 41
City Health Conservation Contest ... 49

Highway Design
Elevated Highway Designs for Speed, Safety and Beauty ... 46

Housing
A Vast Market for New Homes ... 45
Power to Demolish "Untenanted Hazards" .. 91

Legal Decisions
The City's Legal Rights and Duties ... 107

Lighting, Outdoor
The Traffic Day—and Night—in Seattle ... 15
Safety Lighting Proves Itself ... 97
Lighted Water—For More and Safer Swimming ... 127
Getting Somewhere in Highway Lighting ... 129
New Colored Floodlighting ... 129

Motor Equipment
Tractor and Loader, Staten Island ... 11
Tractor and Mower, Hinsdale, Ill. ... 13
Nine-Men Cab on Chicago's New Pumpers. 79

News and Illustrations
Hints for Officials ... 117

Parking Meters
Parking Meters an "Unqualified Success" in 18 Cities ... 7
Congress Approves Parking Meters ... 15
Passaic Likes Parking Meters ... 52

Photography
Growing Applications of Municipal Photography ... 57

Planning
Wise Public Spending Involves Careful Planning ... 37
TVA and the American Dream ... 42
Town Planning Yardstick ... 51
Developing a Metropolitan Area ... 61
Town and Country Planning Summer School 65
Zoning and Planning Notes ... 105

Police and Crime
Lie Detector Admitted in New York City .. 15
Cleveland's Crime Secrets Revealed ... 15

Power Plants
Diesel Generators ... 117
Power Units Meet Many Needs ... 125

Publications
New Books and Pamphlets ... 109

Public Utilities
What Does Electricity Cost? ... 7
TVA and the American Dream ... 42
Mechanized Accounting Aids for Municipal Utilities ... 43

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Public Works Administration
The Cost Per Man of Work Relief ... 54
$1,007,440,512 for 2,714 Local Projects Awaits Funds and Allotments ... 103

Radio
Tornado Relief, Radio-Controlled ... 48
Radio Frequency Checker ... 123

Recreation
Stadium, Clinton, Iowa ... 95

Roadside Improvement
Tractor and Mower, Hinsdale, Ill. ... 13

Sewers and Sewage Treatment
Sewage Must Beware ... 11
Stream Pollution on the Ohio River ... 11
Tractor and Loader, Staten Island ... 11
Small Activated Sludge Plant with Mechanical Aeration ... 55
Servicing a Sludge Digester ... 85
New Non-Clogging Sewage Pumps ... 117
Copper Rings Check Roots Entering Sewer 117
Circular Settling Tanks for Sewage ... 119
A New Indicator for Combustible Gas ... 121
Control Equipment for Sewage Plants ... 123
Sewage Ejectors for Municipal Service ... 123

Street Cleaning
Clean Flushed Streets ... 41

Street Construction and Maintenance
Municipal Asphalt Plant Wise Investment .. 38
Bituminous Paving and Resurfacing, St. Louis ... 50

Street Signs
Concrete Street Signs ... 65

Swimming Pools
The Best Municipal Summer Sport ... 87
Lighted Water—Safer Swimming ... 127

Traffic
The Traffic Day—and Night—in Seattle ... 15
Elevated Highway Designs ... 46
Fellowships in Traffic Control ... 63
Municipal Parking Areas Aid Shoppers ... 91
Telling the Tourist ... 95
Safety Lighting Proves Itself ... 97
How the Safety Contest Winners Did It ... 97
Look at It Through an Engineer ... 97
Providence Traffic Trouble Cut ... 99
Near Versus Far-Side Stops ... 99
Near-Side Stops Preferred ... 99
A Permanent Cure ... 99
New Line Marker with Spray Unit ... 125

Transportation
Fare Increases Cheerfully Granted ... 7

Unemployment Relief
Wise Public Spending ... 37

Waste Collection and Disposal
The Consulting Engineer's Work on Incinerator Projects ... 81

Waterfronts
Perth Amboy Reclaims Valuable Waterfront 71

Water Supply and Water Works
Water for Air Conditioning ... 9
Reservoir for California Exposition ... 9
Simple Control for Water Pumps ... 9
Water-Borne Disease in the United States .. 13
Elevated Water Storage in Jackson, Miss ... 40
Bronze-Welding of Cast Iron Pipe ... 67
The Use of Asphalt as Protection for Reservoirs and Dams ... 73
Two-Stage Centrifugal Pumps ... 119
Equipment to Aid in Water Conditioning .. 119
Light-Weight Line of Centrifugal Pumps ... 119
Water Softener ... 121
Bottle-Tight Joint ... 121
Control Equipment for Water Plants ... 123
Rubber Gaskets for Ceramic Pipe ... 123
Injection Nozzle for Hypo-Chlorinators ... 125
Simple Pumps Easy to Operate ... 125

Works Progress Administration
Perth Amboy Reclaims Valuable Waterfront 71

See pages 17, 18, 20, 109, 111 for catalogs and publications on municipal and civic subjects

For Index to Advertisements see page 132

IN Seattle

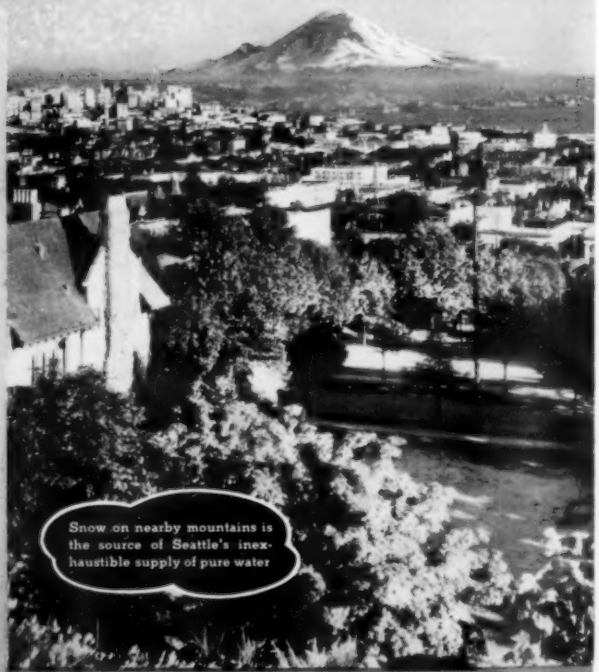
WASHINGTON

Aerial View of Seattle and its Harbor

Rising between two snow-capped mountain ranges—the picturesque Cascades and the thrilling Olympics—stands Seattle, the largest city of its age in the world. Included in its many attractions are its world-famed Public Market, Government Locks second only to Panama's, a modern art museum, parks bordering on sea and lake, and the beautiful University of Washington campus. A half-day's journey from Seattle brings you to Grand Coulee Dam, the largest structure ever built by man.

Every great city gets its support from basic industries or resources of the region of which it is a part. Lumber and fish are two of the great resources of the Pacific Northwest of which Seattle is the largest city.

Seattle's water supply is the Cedar River in the Cascade Mountains. Its water rates are among the lowest in the United States. If figured on a ton basis, the rate would be less than 2 cents per ton, delivered from the Cascades to the consumer's tap. Seattle is another great city where Pittsburgh Meters are used in their water metering program.



Snow on nearby mountains is the source of Seattle's inexhaustible supply of pure water

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PITTSBURGH WATER METERS

Kinds of Cities—Salaries of Councilmen

Forms of Government in All Municipalities of Over 5,000 Population

THE accompanying tables are reproduced from The Municipal Year Book: 1938, published last month by the International City Managers' Association. This year the annual summary of forms of government and other governmental data concerning American cities has been extended to include the 849 cities between 5,000 and 10,000 population, in addition to all cities of over 10,000 reported in previous issues.

Other tables in the chapter on "Governmental Data on the 1,809 Cities Over 5,000 Population" cover the number of councilmen per city, the type and method of electing them, and their terms of office. The choice in most cities, as indicated in the last-mentioned table, narrows down to the two- or the four-year term, with mayor-council cities preferring the two-year term, commission cities preferring the four-year term, and council-manager cities being about equally divided between the two. A few of the smaller cities between 10,000 and 30,000 continue to hold annual council elections, most of them having the town meeting form of government. Three-year terms are in effect in some cities, mostly in the smallest population group, while a few cities prefer five-and six-year terms.

The trend toward longer terms for councilmen was continued in 1937, as 30 of the 38 cities which changed the terms of councilmen lengthened the term, including 14 Illinois cities operating under a 1935 statute which prescribed four-year terms for all cities unless the two-year terms were adopted by referendum.

Salaries of Councilmen

THE table in the adjoining column summarizes the salary figures as given for the complete list of municipalities in The Municipal Year Book. The tendency of commission cities to pay higher salaries to councilmen in view of their additional administrative duties is apparent, while nominal salaries are the rule for mayor-council and council-manager cities below 100,000 population. In only 15 cities are councilmen paid $5,000 or more: New York, Chicago, Philadelphia, Detroit, Pittsburgh, Birmingham, Cincinnati, Memphis, Newark, New Orleans, Portland (Oregon), San Antonio, Baton Rouge, Mobile, and Shreveport. No salaries at all are paid to council members in 405, or 23 per cent, of all the reporting cities of over 5,000 population.

FORM OF GOVERNMENT IN 1,808 AMERICAN CITIES OVER 5,000 POPULATION BY POPULATION GROUPS *

Population Group	Total Number of Cities	Mayor-Council		Commission		Council-Manager		Town-Meeting	
		No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
Over 500,000	13	13	100.0	...	...	...	...	...	...
200,000 to 500,000	27*	10	37.0	10	37.0	7	26.0	...	...
100,000 to 200,000	52	31	59.6	11	21.2	10	19.2	...	...
30,000 to 100,000	217	107	49.3	52	23.9	55	25.4	3	1.4
10,000 to 30,000	650	389	59.8	113	17.4	114	17.6	34	5.2
5,000 to 10,000	849	611	72.0	82	9.6	106	12.5	50	5.9
All Cities over 5,000	1,808	1,161	64.2	268	14.8	292	16.2	87	4.8

* Washington, D. C., has been omitted because it is governed by Congress and an appointed commission of three, and thus cannot be classed under any of the common forms of municipal government.

SALARIES OF COUNCILMEN IN 1,747 CITIES BY FORMS OF GOVERNMENT AND POPULATION GROUPS *

Population Group	Mayor-Council	Commission	Council-Manager	Town Meeting	All Cities
Cities over 500,000					
No. of Cities Reporting	13	(None)	(None)	(None)	13
Lowest	$1,800	...	...	...	$1,800
One-Fourth Pay Less Than	2,400	...	...	...	2,400
Median	3,000	...	...	...	3,000
One-Fourth Pay More Than	5,000	...	...	...	5,000
Highest	8,500	...	...	...	8,500
200,000 to 500,000					
No. of Cities Reporting	10	9	7	(None)	26
Lowest	500	3,600	1,040	...	500
One-Fourth Pay Less Than	600	4,500	1,200	...	1,200
Median	1,100	5,000	1,500	...	2,400
One-Fourth Pay More Than	1,500	6,250	3,000	...	5,000
Highest	3,000	7,500	5,000	...	7,500
100,000 to 200,000					
No. of Cities Reporting	31	11	10	(None)	52
Lowest	0	3,000	360	...	0
One-Fourth Pay Less Than	100	3,600	600	...	400
Median	400	4,000	750	...	600
One-Fourth Pay More Than	600	4,500	1,200	...	2,200
Highest	2,850	4,800	1,800	...	4,800
30,000 to 100,000					
No. of Cities Reporting	106	50	55	3	214
Lowest	0	300	0	500	0
One-Fourth Pay Less Than	180	2,250	200	...	250
Median	360	3,000	400	600	500
One-Fourth Pay More Than	550	4,000	750	...	1,900
Highest	3,600	7,000	3,000	1,500	7,000
10,000 to 30,000					
No. of Cities Reporting	375	104	114	21	614
Lowest	0	0	0	0	0
One-Fourth Pay Less Than	0	750	0	200	75
Median	150	1,200	150	350	200
One-Fourth Pay More Than	350	1,800	300	500	600
Highest	3,600	4,000	1,500	1,600	4,000
5,000 to 10,000					
No. of Cities Reporting	597	82	105	44	828
Lowest	0	0	0	0	0
One-Fourth Pay Less Than	0	300	0	150	0
Median	100	500	100	250	100
One-Fourth Pay More Than	150	1,000	150	400	240
Highest	2,500	3,000	1,800	2,500	3,000
All Cities over 5,000					
No. of Cities Reporting	1,132	256	291	68	1,747
Lowest	0	0	0	0	0
One-Fourth Pay Less Than	0	600	0	175	75
Median	125	1,500	125	300	150
One-Fourth Pay More Than	300	2,600	400	500	400
Highest	8,500	7,500	5,000	2,500	8,500

* This table shows for each population group and each form of government the lowest, highest, median, first and third quartile salaries paid to councilmen. Twenty-five per cent of the cities in each group pay salaries less than the first quartile, 50 per cent less than the median, and 75 per cent less than the third quartile. Data for the town-meeting cities refer to the selectmen.

The *Municipal Year Book*, from which the foregoing tables were reproduced, should of course be distinguished from THE AMERICAN CITY'S annual, *The Municipal Index*, the 1938 edition of which also appeared last month. For brief reviews of both annuals, see page 109 of this issue.

Big Kokomo Steel Mill

NOW HAS 5 LAYNE DEEP WELL UNITS

The Continental Steel Corporation of Kokomo, Indiana, is another of the many large, aggressive and careful-buying firms who have chosen Layne Wells and Pumps to supply their water needs. Five large rock wells produce 4,000 gallons of water per minute, whereas requirements called for only 3,000 gallons. Depths range from 125 to 425 feet in limestone formation. All motors, casings, fittings, pumps and other equipment are identical with the exception of depth variation.

Layne Wells and Pumps are widely used, designed for, and more often preferred, by all kinds of industries. They are noted for their high efficiency and low upkeep costs. It is the business of this Well Water Developing organization to plan, drill, and equip the wells completely. Let us send illustrated literature and more complete details of our services in the field of deep well water production. Address, Layne & Bowler, Inc., Dept. B, Memphis, Tenn.

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Our Municipal Notebook

Parking Meters an "Unqualified Success" in 18 Cities

MAYORS and other municipal officials of New York State through their Bureau of Municipal Information have just gathered from 37 cities using parking meters exhaustive data on the use of parking meters and the results obtained. The inquiry, dated March 25, is in twelve major divisions:

1. What size cities; make; number and price of meters
2. Type of meter; parking time and charge
3. Would a penny charge increase the use of meters?
4. Collections
5. Results
6. Penalty for violations
7. Legality
8. Revenue and public attitude
9. How satisfactory is system?
10. Suggested improvements
11. Attitude of local auto clubs
12. Statements from city officials

The obvious purpose of such an extensive inquiry as this is to find out (1) whether or not the use of parking meters reduces parking congestion and thus improves traffic conditions in the business district; (2) if so, how it is accomplished; (3) what the local public attitude is toward the system.

Results

Do meters reduce cruising of cars?

The entire 37 cities answer yes, and in 23 instances voluntarily elaborate the answer by giving figures ranging from 25 to 90 per cent reduction in cruising to find space.

Do meters speed up traffic?

The answer is yes for 36 cities, and no for Ponca City, Okla.

Do more cars find parking space?

The entire 37 cities answer yes.

Has city been held liable for damages to parked autos?

All cities answer no.

What per cent of the merchants are pleased?

Of the 27 cities answering this question, one reports 65 per cent, two 80, one 85, six 90, one 92, four 95, one 98, two 99, nine 100 per cent.

What per cent of the parkers are pleased?

Of the 27 cities answering, one (Mexico City) reports 50 per cent, one 65, two 75, three 80, two 85, six 90, four 95, one 96, seven 100 per cent.

Is your meter system an unqualified success?

Nineteen cities do not answer this question. The answer is no for Pocatello, Idaho, St. Petersburg, Fla., and Wichita Falls, Texas, and "Not exactly" for Austin. The answer is yes for the following 18 cities:

	Population
Atlantic City, N. J.	60,000
Bakersfield, Calif.	35,000
Clarksburg, W. Va.	30,000
Clearwater, Fla.	20,000
Cumberland, Md.	40,000
Dallas, Texas	299,000
El Paso, Texas	102,000
Hagerstown, Md.	33,000
Houston, Texas	400,000
Long Beach, Calif.	170,000
Norfolk, Va.	129,710
Oil City, Pa.	22,000
Oklahoma City, Okla.	215,000
Omaha, Nebr.	220,000
Pittston, Pa.	19,000
Toledo, Ohio	293,000
Uniontown, Pa.	20,000
Wilmington, Del.	115,000

What per cent of the city officials are pleased?

Of the 31 cities answering this question, Mexico City says 20 per cent, Pocatello says 83 per cent, Clearwater 90, Miami 99, and the remaining 27 cities report 100 per cent.

The remainder of the report is packed with valuable figures and information giving the type of meters, whether they give a receipt, whether the coin box is sealed and how often it is wound, whether double time is allowed for two nickels, and how unexpired time is used, violations before and after installing the meters. Clearly the mayors and other municipal officials of the state of New York want to know all about parking meters, and have about found out.

Fare Increase Cheerfully Granted in Shreveport, La.

AT opening meetings of the Shreveport, La., City Council, the local transit company achieved the feat of obtaining, without a dissenting vote, an increase in fare from 6 cents to 7 cents. It is believed that this pleasant public attitude is a tribute to the utility's good-humored, energetic and intelligent improvement of transit service since 1932, culminating in the change of the eighth and last car line to trolley-coach operation. In these six years, passenger traffic, which had dwindled by 46 per cent, has increased by 147 per cent. Receiver Ed. Jacobs of the Shreveport Railways Co. has taken several merited bows.

What Does Electricity Cost?

AS a kwh factory, the municipal electric utility is perfectly understandable. Its function is to make and sell "juice" to the consumer-citizens of the community.

What ought the rates to be?

That question disturbs the equilibrium completely, for there are almost as many rates and rate structures as utilities.

Yet the correct answer to that question will decide whether the municipal utility is to be a rugged publicly-owned individualist serving the town in the way the town desires it to, or whether it is to be one of 2,000 reasonably accurate yardsticks of the cost to produce and deliver electricity at its location.

At the present stage of the electrical art, it would seem that the greater service which the city-owned generating plant can furnish is as a cost index.

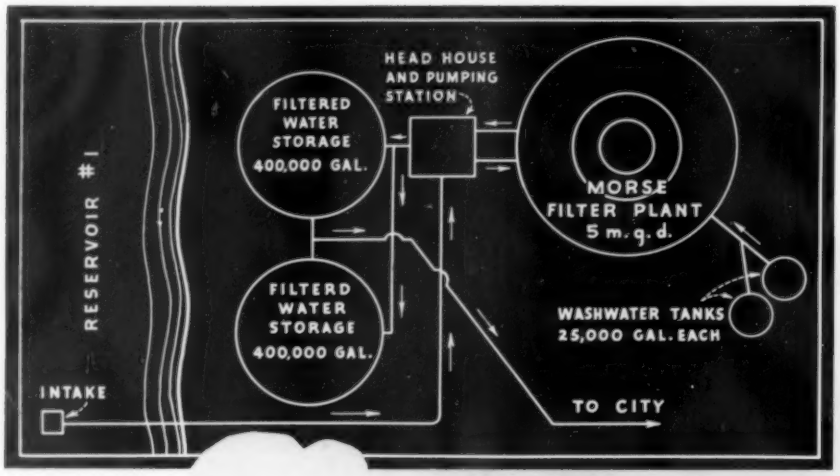
Riley E. Elgen, Chairman of the Public Utilities Commission of the District of Columbia, has dived into the rates of some 1,200 municipal utilities and emerged with certain empirical formulas based on the prevailing conditions which he found. By one of these formulas it is possible to test any rate structure, proving it either "rational" or out of step with the majority. Another formula "permits the testing of rates in communities of less than 50,000 people, against rates in cities of more than 50,000 for the purpose of determining whether the proper relationship exists."

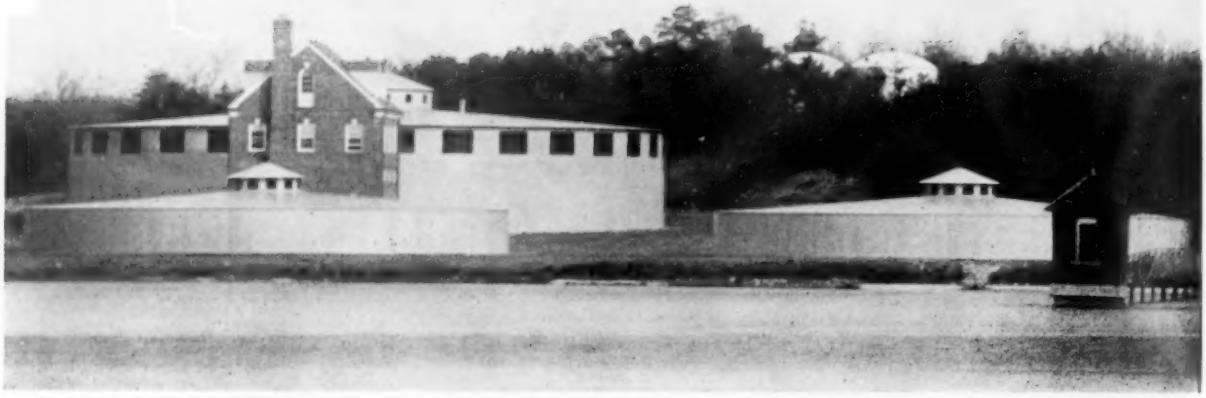
Mr. Elgen's studies are frankly based on things as they are, and his formulas are "power rollers" which tend to level all existing rates into average existing rates. His study is of practical value in that it calls attention to all these rate differences, furnishes a rule-of-thumb method of analyzing each with the average, and is likely to cause a number of them to be explained or defended.

In the event that the principle of the yardstick should win out over the principle of making a profit for the city, the resulting rates would be reflections of plant and system efficiency, cost-accounting methods, management policy. Much could then be done with these local-cost data to improve the generation, distribution and use of electric power.

Bigger Fire Pumps

THE N. F. P. A. Committee on Municipal Fire Apparatus is recommending to the N. B. F. U. that, taking effect January 1, 1939, pumps be rated 150 pounds per square inch instead of 120 pounds, and deliver 70 per cent of capacity instead of 50 at 200 pounds, and 50 per cent instead of 33 1/3 at 250 pounds.





A Model Filter Plant for Bristol, Connecticut

WHEN Bristol, Connecticut, first considered the possibility of providing filtered water for its population probably no one dreamed that the ultimate solution would prove to be one of the most advanced in the country. Now attracting wide attention among water works engineers, the completed plant shown above is outstanding for its effective combination of large capacity with small size. This was made possible by utilization of the Morse "ALL-STEEL" type of design.

Bristol obtains its water from a water shed near the town—the water being collected in a series of reservoirs. The Morse Filter Plant is located near Reservoir No. 1 which is about a mile distant and at some elevation above the city proper. As indicated by the diagram, water is pumped from the reservoir to the filter plant by means of low lift pumps. From this point, it flows by gravity through the filtering process into the filtered water storage tanks and from there into the distribution system without repumping.

The plant has a nominal capacity of 5 m.g.d. which permits meeting present demands with about 18 hours operation daily. In addition to the filter plant and the two filtered water storage tanks, other steel platework supplied included two 25,000-gal. washwater tanks which are used each day to clean the filter beds.

We shall be glad to give you the complete story on the advantages and opportunities offered by the Morse "ALL-STEEL" type of construction for filter plants. Please address our nearest office.

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Cleveland.....2236 Rockefeller Bldg.
Detroit.....1501 Lafayette Bldg.
Philadelphia..1616 "1700" Walnut St. Bldg.
Boston.....1501 Consolidated Gas Bldg.
Birmingham.....1502 N. Fiftieth Street
Dallas.....1406 Liberty Bank Bldg.
San Francisco.....1633 Rialto Bldg.
Houston.....2919 Main Street
Tulsa.....1625 Hunt Bldg.
Los Angeles.....1403 Wm. Fox Bldg.

Fabricating plants in CHICAGO, BIRMINGHAM, and GREENVILLE, PA.

Water Supply and Air Conditioning

Don't Worry About the Water Used for Air Conditioning

WALDEMAR KAEMPFFERT, Science Editor of *The New York Times*, has gathered some information which goes a long way to allay the fears of water-works officials that the new science of air conditioning will use up all the available water allocated to domestic uses.

The number of air-conditioning plants in the United States has increased 1400 per cent since 1933. About 40 per cent of these depend on local water supplies to cool and humidify air. Where is the water to come from? The Bureau of Foreign and Domestic Commerce has taken up the subject in a report which indicates that the flowering air-conditioning industry may find expansion difficult in the face of a water shortage. The Bureau's report is based on a survey of the water and sewer systems of 91 cities in the United States with a population of 100,000 and more.

As might be expected, the engineers contend that the report paints too dark a picture. It incorrectly assumes that air-conditioning plants operate 24 hours a day all the year round. If water is used for condensing, the average period of operation is about 750 hours a year, with 500 as a minimum and 1,200 the maximum. Allowing 100 gallons of water for each horsepower per hour, the air-conditioning installations of the country—their total horsepower was 433,000 at the end of 1936—would consume between 13 and 15 billion gallons of water annually. This is less than 1 per cent of the total water consumption of all cities of 100,000 population and more.

The demand for water fluctuates as business is good or bad. When factories either close or work on half time, it goes down. When business improves, as it did in 1935, more water is used.

That rising industrial prosperity explains some of the increase in the use of water between 1931 and 1936, banner years for the air-conditioning salesmen, is shown by towns where there is little or no air conditioning. Thus the water demand of Akron, Ohio, increased by 14.6 per cent during the 5-year period in question; that of Bridgeport, Conn., 19.6 per cent; Duluth, Minn., 18 per cent; Toledo, Ohio, 10.9 per cent; Waterbury, Conn., 10.5 per cent; Hartford, Conn., 5.7 per cent; Lowell, Mass., 4.8 per cent. On the other hand, air conditioning probably accounts for the increase in water needs during 1931 and 1936 in such cities as Dallas, Texas, 25.8 per cent; Louisville, Ky., 26.7 per cent; Washington, D. C., 15.2 per cent; New York City, 3.6 per cent; Kansas City, Mo., 8.2 per cent.

How hard it is to make correct deductions from tables of water consumption is shown by Miami, Fla. In that city the total annual water delivery increased by more than 50 per cent between 1931 and 1936. But since most of the water there used for air conditioning comes from wells, it is improbable that the figure indicates an excessive demand on the city's mains. In fact, Miami's water supply was operated at only 60 per cent of its capacity in 1936.

Water is needed to humidify air that is too dry, or to cool condensers. Air is humidified chiefly in winter and cooled chiefly in summer. The amount of water needed for humidifying is small. A home with 15,000 cubic feet, for example, would need about 18 gallons a day in zero weather with a total of 160 a day flowing through the humidifier. This is almost negligible compared with the 15 to 25 gallons of hot water alone which must be provided every day for each occupant of a house.

It is the condensing system of an air-conditioning plant that makes the heaviest demands on a city's water mains. So necessary a convenience as air conditioning is not likely to be halted in its development by a lack of water. What, then, can the engineers do? The answer is to be found in the cooling tower and the evaporative condenser. Either uses water over and over again. Either will reduce the usual water consumption of an air-conditioning system to 5 or 10 per cent of the normal requirements. And either will save at least 90 per cent of water costs compared with waste-water systems. So far as the engineers are concerned, the water-supply problem is already solved, and with it the water-disposal problem.

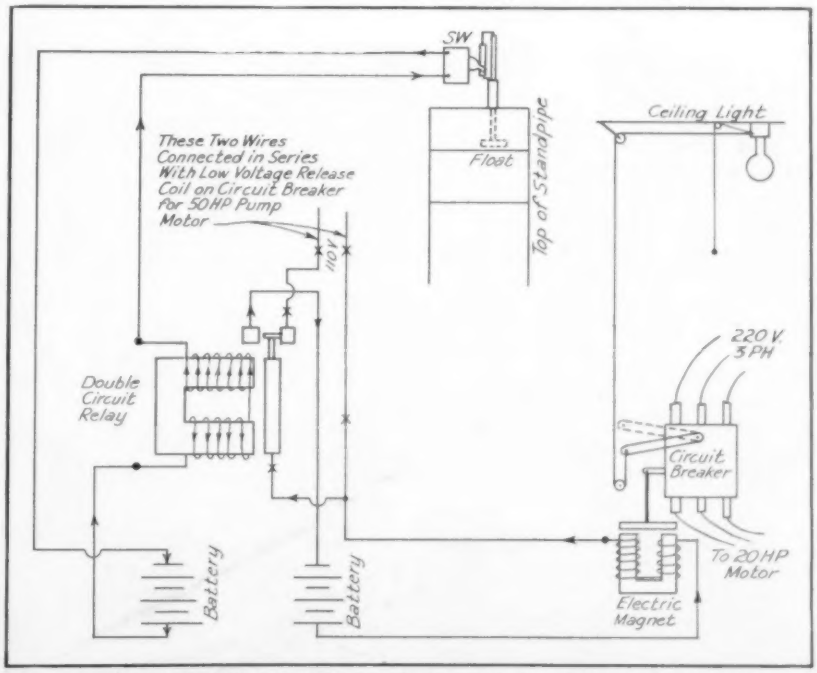
Water-Supply Reservoir for California Exposition

THE 3,000,000-gallon reservoir for the 1939 Golden Gate International Exposition, cut into the solid rock of Yerba Buena Island in San Francisco Harbor, has received its finishing coat of gunite. Approximately 25,000 cubic yards of rock were excavated by the U. S. Army Engineers on this job. The reservoir will be fed by a 10-inch steel pipe line, which is being laid on the San Francisco-Oakland Bay Bridge by Herman Lawson at a cost of $113,000. Water connections were completed late in 1937.

Simple Control for Water Pumps

THE most interesting job we have undertaken recently in the Municipal Light and Water Department, Caledonia, Minn., is the installation of simple stops for the motors used to drive the water-works pumps. The accompanying sketch shows the hook-up which we have used successfully now for over a year at the water-works plant. No doubt a mercury type switch would be a more logical installation on top of the standpipe, but I devised this one from an ordinary toggle-switch. The apparatus has failed but once, and that was due to an accumulation of ice on the guide rod which is connected to the float. A little change in design easily overcame this defect.

ABNER HOUGE,
Superintendent, Municipal Light and Water Department, Caledonia, Minn.



SIMPLE HOMEMADE CONTROL DEVICE FOR CUTTING OUT WATER-WORKS PUMPS AT CALEDONIA, MINN., WHEN THE TANK IS FULL

MATHIESON CHLORINE SERVES LINCOLN SEWAGE PLANT

Says Wardner G. Scott, Engineer, Sanitary District Number One of Lancaster County, Nebraska:

"The quality of Mathieson Liquid Chlorine, together with the prompt service on shipments has been entirely satisfactory at all times."

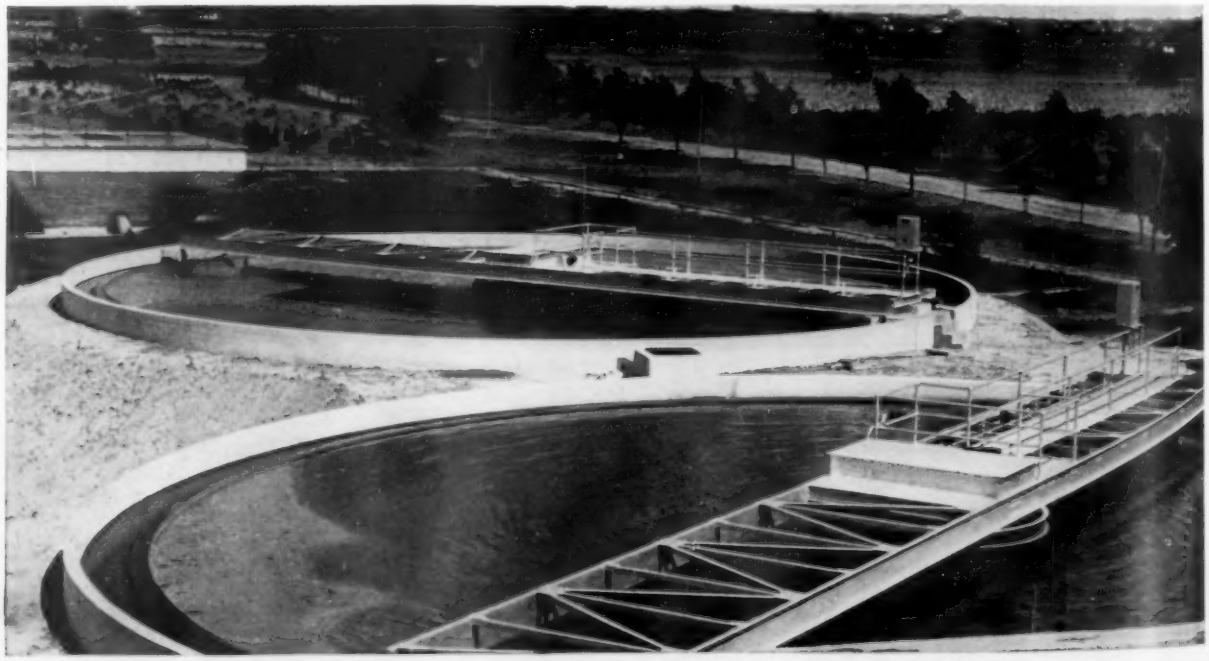
ABOVE all else, whether the job in hand be water purification, sewage treatment or swimming pool sanitation, your supply of liquid chlorine must be dependable. You have a right to expect at all times a pure product, trouble-free containers and valves, prompt delivery service.

At Lincoln, Nebraska, where the sewage treatment plant uses chlorine in ton containers, Mathieson Liquid Chlorine has been proving its dependability over a period of years. As Mr. Scott states, he has found the quality of the product and the prompt service on shipments entirely satisfactory at all times.

Because so many sanitary officials have had the same experience as Mr. Scott, they have learned to specify Mathieson whenever there is a chlorinating job to be done.

The MATHIESON ALKALI WORKS (Inc.)
60 East 42nd Street **New York, N. Y.**

Soda Ash . . . Liquid Chlorine . . . Bicarbonate of Soda . . . HTH and HTH-15 . . . Caustic Soda Bleaching Powder . . . Ammonia, Anhydrous and Aqua . . . PH-Plus (Fused Alkali) Dry Ice (Carbon Dioxide Ice)



During May we hope you will remember to mention THE AMERICAN CITY.

Stream Pollution by Sewage

Sewage Must Beware

A SHORT time ago Mrs. Catherine W. Sanders brought suit against the city of Birmingham, Mich., for creating a nuisance with its sewage in the River Rouge. She was awarded $4,000 damage and a remission of back taxes, amounting to $200. The city has since bought 66 acres for a sewage-treatment plant at the cost of $40,000, and plans for improvement are under way.

A similar suit was recently brought against the city of Chelsea, Mich., which was settled for $400. The city immediately got busy and put in a treatment plant.

A short time ago I was talking with Charles Fisher of the Fisher Body Co. He said that a few years ago he bought 900 acres near the Clinton River. He had expected to spend thirty to forty thousand dollars on it and develop a country estate, but when he discovered how the river smelled from the sewage, he abandoned the idea and went south and purchased an estate in Kentucky.

The land along the Huron River for 50 miles or so is probably worth on an average at least $300 an acre, but near the garbage reduction plant of Detroit land has been offered recently for less than $100 an acre.

The sewage of Pontiac has probably decreased the value of the property below it on the river by at least $100,000. One can but wonder why those whose property is injured in this way do not more often bring suit. So far as the cities are concerned, they always put the sewage in below, so that their neighbors rather than themselves must suffer the consequences. A few such suits that are fully justified by conditions would quicken their conscience considerably.

HENRY C. CURTIS,
Executive Secretary, Huron Clinton Parkway Committee, Ann Arbor.

Stream Pollution on the Ohio River

DURING the past two years or more in which there has been a concerted effort for pollution abatement on the Ohio River watershed, information has been secured on the effect, at many points, of the pollution being discharged in the form of untreated sewage and industrial wastes. In a paper presented before the Ohio Valley Improvement Association by H. R. Crohurst, Senior Sanitary Engineer, U. S. Public Health Service, it is pointed out that the problem is conveniently divided into: (a) the upper drainage basin, extending downstream to below the Ashland-Ironton area on the main river, some 350 miles below Pittsburgh, in the watercourses of which the pollution problem is complicated by the presence of varying amounts of acid mine drainage from past and present coal-mining operations; and (b) the lower watershed from Portsmouth, Ohio, to the mouth, in which the acid drainage and its effects have largely disappeared and the pollution problem is one of the effect of untreated domestic sewage and manufacturing wastes.

Both on the Ohio River proper and for varying distances above the mouths of many of the larger tributaries, the pollution problem is still further complicated, during the critical summer months of decreased stream discharge, when objectionable conditions due to pollution are most likely to occur, by the presence of numerous dams constructed to form navigation pools during these periods of minimum run-off.

Mr. Crohurst states:

1. Pollution at Pittsburgh has reached the point where nuisances might occur in the summer months if it were not for the effects of acid mine drainage present.

2. Acid drainage, while decreasing the effect of pollution near the point of discharge, may be responsible for excessive pollution downstream, owing to its action of delaying bacterial activity until dilution has removed the inhibitive action of the acid.

3. The removal of large amounts of acid, together with normal increases in sewage and industrial waste pollution, will decrease the inhibitive action of the acid and tend to confine the effects of pollution coming from the Pittsburgh area to that vicinity, with the possible production of nuisances at Pittsburgh if sufficient acid is removed.

4. Pollution at Cincinnati, and probably at other points, has at times reached such a concentration, in the absence of acid drainage, that oxygen depletion is occurring. Future increases in pollution will be conducive to actual nuisance conditions along the waterfronts.

5. From the standpoint of public health, the greatest problem of existing pollution is its effect on public water supplies:

(a) By the overloading of water-treatment devices to the point of passing intestinal disease organisms, conditions which now appear to have been approached in the Ashland and Ironton area most of the time, and at a number of other places a large percentage of the time; and

(b) By the production of intestinal irritants in the water, during long periods of pool stage, which are not removed by filtration nor indicated by the usual tests of a potable water. As pollution increases, the tendency may be toward the production of such irritants more frequently at times of more nearly average summer flow rather than at times of extreme low water as in the past.

The solution of these problems, resulting mainly from the solid material and the bacteria of the sewage and industrial wastes, would appear to be in their removal, the solids by methods of sewage treatment, the bacteria by disinfection.

The degree of treatment required at specific points on the watershed, or the order of installing the necessary treatment devices for the greatest improvement in sanitary conditions for the least expenditure, can be ascertained only after more detailed information becomes available on the amount and distribution of pollution and the relations that exist between the several factors influencing the effect of pollution after reaching the watercourses.

BACKFILLING A SEWER TRENCH ON STATEN ISLAND, N. Y., WITH AN ALLIS-CHALMERS MODEL WM TRACTOR AND HOUGH FRONT END LOADER EQUIPPED WITH A BULLDOZER BLADE

The soil is clay and the water-table was only a few inches below the surface. Water had to be pumped from the ditch continuously to allow the men to lay the pipes

How to "*Winterproof*" your water mains

"OLD MAN WINTER" has long been a bugaboo to waterworks engineers. For just as soon as temperatures drop below freezing, and subsoils freeze, the number of breaks in friable water mains has always gone up by leaps and bounds.

The reason for this is no mystery—it is simply a matter of the difference between frozen and unfrozen soil. Unfrozen earth has a cushioning effect that damps out surface vibrations. Frozen earth is rigid and hard, transmits vibrations to considerable depths. And if there is a water main below, it must be able to withstand vibration successfully, or the result is often a broken main.

But "Old Man Winter" is no match for NATIONAL Steel Pipe. For this pipe, made from high-grade steel, is flexible and resilient. Heavy traffic vibrations have no effect on it, winter or summer.

This is only one of the ways NATIONAL Steel Pipe saves your system money. Since it comes in longer lengths, it requires fewer joints, costs less to lay, and gives you a more dependable main. Where corrosion is a factor you have a wide selection of surface coatings from which to choose—which will adapt the pipe to practically any soil condition. Moreover, the extra tensile strength of steel is a worth-while asset wherever high water pressures are involved.

For trustworthy water mains, insist on NATIONAL Steel Pipe. Low laying costs and freedom from troublesome breaks will reflect credit on your judgment. It gives you the most service per dollar of cost—the greatest safety that money can buy. And your city will receive the benefit of thoroughly dependable water service.

FOLLOW THE TREND TO NATIONAL STEEL PIPE Because it:

1. Offers greater all-round reliability.
2. Has low friction loss . . . greater carrying capacity.
3. Eliminates risk of sudden fractures.
4. Saves money on repair bills.
5. Helps keep streets open for traffic.
6. Withstands higher pressures.

NATIONAL TUBE COMPANY

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Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

When you write for that catalog, kindly mention THE AMERICAN CITY.

Water-borne Disease---Mosquitoes and Weeds

Water-borne Disease in the United States

THE report of the Committee on Water Supply of the American Public Health Association recently published in the *Journal* is devoted to a study of water-borne outbreaks in the United States and Canada from 1930 to 1936. The conclusions drawn from this report are very interesting and should serve as a warning to all water-works authorities in the United States to be ever on the watch to prevent such outbreaks in the future. The conclusions are:

(1) While there has been a continued decline in the typhoid fever rates in the United States and Canada during the last seven years (1930-1936), in the number of water-borne outbreaks reported there has not been a similar decline. The relation of unusual weather conditions to water-borne outbreaks is clearly indicated.

(2) The large water-borne outbreaks in the United States during this period were considerably smaller than in the previous decade, and with one exception this was true in Canada.

(3) During the seven years 1930-1936 there were reported water-borne outbreaks of Flexner dysentery, amoebic dysentery and jaundice, in addition to typhoid fever and miscellaneous diarrheas.

(4) In both countries there appears to be need for far more strict supervision over the public water supplies of the small cities of 1,000 to 5,000 population groups.

(5) The water supplies of rural schools, public institutions and summer resorts are especially in need of more strict supervision by public health officials.

(6) During the period 1930-1936, 44.7 per cent of the water-borne outbreaks reported in the United States were in the summer season July, August and September; in Canada 63.1 per cent were in the late winter and spring months of February, March, April and May. Cold weather and thaws appear to have a definite relationship to the water-borne outbreaks in Canada.

(7) Untreated ground water supplies—especially shallow wells contaminated by surface pollution—were the principal cause of water-borne outbreaks in the United States during this period. In Canada the use of polluted untreated surface waters without treatment was the principal cause of such outbreaks.

(8) In the United States during the last seven years the large number of water-borne outbreaks and illnesses caused by improper purification methods, especially in the application and control of chlorination, were a distinct reflection upon water-works and public health officials.

(9) In both the United States and Canada there is need for more strict supervision over water en route to the consumer, through the distribution system, especially in the elimination of cross-connections with polluted water systems and the use of auxiliary intakes to polluted sources of supply.

Mosquito Control by Dusting from Airplanes

FOLLOWING numerous experiments by TVA and U. S. Public Health Service sanitary engineers, it has been determined that airplane dusting for anopheles control is a practical and relatively economical larvicidal operation. Uniformly excellent control of anopheles breeding has been secured with this operation in situations characterized by rather open water which contains low, emergent vegetation, where any other larvicidal operation would have been impractical. With airplane dusting, the effectual control of breeding in situations where the water surface is protected by dense, horizontally interlocking vegetation, has never been secured. The experimental dusting under such conditions was approximately 70 per cent effective. The larvicidal dust used in this work was composed of paris green and powdered soapstone in varying proportions.

The cost of operating a dusting airplane varies considerably, but may be set at about $40 per hour. This is no inconsiderable sum, but, considering that 33 acres per minute can be treated for $0.367 per acre by an airplane flying at 82 miles per hour, the rationale of airplane dusting becomes evident. The economy of the operation is dependent upon several factors, such as the distance the dust might be transported by airplane before dusting is begun; the number of flying hours during a season's work; and the size and nature of the acreage to be treated at routine intervals. The control problem must be large enough to justify airplane dusting.

In order to reduce non-dusting flying time to a minimum, four landing strips were constructed in the Lake Wheeler reservoir area at points convenient to the zone of operations, and the airplanes were loaded at these places. Reduction of the non-dusting flying time increased the efficiency of the operation by allowing full advantage to be taken of the short, early morning period when dusting was done.

One experimental flight at 75 feet produced excellent results and seems to indicate the feasibility of dusting at higher altitudes than has been the practice heretofore. Theoretically, the release of more concentrated paris green dusts at higher altitudes should lower the cost of airplane dusting operations. It is believed now that under optimum conditions the effective swath delivered at an altitude of 25 feet may be 300 feet in width, and that uniform distribution of concentrations of paris green of less than 1 pound per acre will produce excellent results. The width of the dust swath increases with the altitude at which the dust is liberated, within limits, and higher flying should therefore reduce the total flying hours.

Even when there is no wind, the dust cloud tends to drift to some extent, and it has been found difficult to place the dust cloud accurately at altitudes higher than 30 feet. Accurate placement of the dust cloud is very necessary to prevent unnecessary waste of dust and to secure

—From a paper appearing in *Public Health Reports*, U. S. Public Health Service, pages 251-263, February 18, 1938.

HINSDALE, ILL., USES THIS INTERNATIONAL I-12 INDUSTRIAL TRACTOR EQUIPPED WITH A MOWER TO CUT EDGES ALONG THE CURB AND SIDEWALKS AS WELL AS TO TRIM HEDGES THAT ENCROACH ON THE SIDEWALK

It was especially effective in a ragweed eradication campaign to relieve hayfever sufferers

ELEMENTS of PUBLIC SAFETY

GAMEWELL

THREE-FOLD FIRE ALARM BOX

Not more than 500 feet to the nearest box in closely-built residential districts . . . convenient to every group of buildings, manufacturing establishments, and institutions in sparsely-built districts . . . in congested high-value districts—"*A Box a Block*" — with special attention to Life Hazards . . . a safe rule to follow.

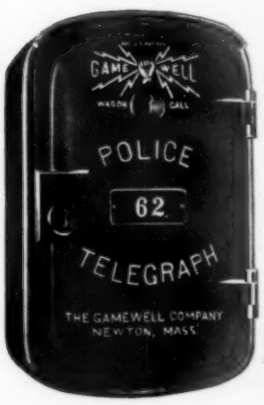
TIME— THE VITAL ELEMENT

Low fire losses do not always indicate the absence of fire hazards. Fires occur in every community and where the means for fire control are efficient and have been so effectively used as to limit the losses to low figures, the community is to be congratulated. But, it should be remembered that the difference between a low and an excessively high per capita fire loss frequently consists of but one or a few large fires. In such cases, there is almost invariably a story of delay in bringing to bear the available fire extinguishing resources.

The function of the fire alarm system is to save time when fire is destroying property. Fire Alarm Boxes adequately distributed and accessible to all citizens provide the means for eliminating delay.

Reliable fire alarm systems are essential to the protection of Life, Property and Business.

EXEMPLAR POLICE BOX



Police Signal Systems provide . . . adequate patrol of policed areas . . . secrecy in police communications . . . prompt assistance in emergencies . . . direct connection with police department for banks, commercial establishments and residences . . . the basic element in communications . . . enabling the police forces to attain the highest degree of operating efficiency.

Write for descriptive literature.

THE GAMEWELL COMPANY

NEWTON UPPER FALLS MASSACHUSETTS

Public Safety

Lie Detector Admitted in New York City

RECALLING that the courts had once barred fingerprints and bullet markings as evidence, Judge Charles S. Colden of Queens County Court, New York City, ruled on March 30 that the jurors in a hold-up trial before his court might evaluate the findings of the lie detector in the same manner as any other evidence. Rev. Walter G. Summers of Fordham University applied the lie detector and asked the prisoner 28 questions, 19 irrelevant and three repeated three times each, dealing with the hold-up. The prisoner's emotional reaction indicated that he was telling the truth.

"Is it not possible for the subject to control his emotions and defeat the purpose of the examination?" asked J. Irwin Shapiro, Assistant District Attorney, during cross-examination.

"That is not possible," Father Summers replied, "because the more phlegmatic, the more stoic, the better the subject. Even though the subject can control parts of the body, it does not affect the accuracy of the recording."

Year's Work of the Biggest Diesel Fireboat

CHICAGO'S diesel fireboat, described here last November, had been in operation one year on April 24. Ten months' action to March 31 was as follows:

Number of alarms	144
Hours worked	90
Miles traveled	441

Commenting on the economy of the boat, Fire Commissioner Michael J. Corrigan said: "When the Fred A. Busse is not in service there is no fuel consumption except for heating purposes for the crew."

Congress Approves Parking Meters

CONGRESS adopted parking meters for the District of Columbia by a vote of 214 to 119, and plans call for the installation of 320 meters.

The Traffic Day—and Night—in Seattle

THE number of accidents, the number of injured and killed in the city of Seattle, and the circumstances, are carefully analyzed graphically by J. W. A. Bollong, Traffic Engineer of that city. The accompanying chart shows at what hours the troubles took place. The peaks for fatalities, of which there were 101, were at 1:30 A.M., 6 P.M., and 10:30 A.M. Half the accidents took place between 6 P.M. and 6 A.M.

New Orleans Will Improve Fire Department

MAYOR ROBERT S. MAESTRI of New Orleans, La., is reorganizing fire companies and fire stations. One old station has already been abandoned, new stations are being planned for two areas at present under-protected, and the land-taking will soon be completed for the construction of a downtown central station to replace three nearby antiquated fire stations. The re-establishment of a fire-prevention bureau in the Fire Department and the installation of a new fire-alarm system are in the offing.

Cleveland's Crime Secrets Revealed

CLEVELAND, OHIO, is launching a crime-prevention drive that calls for enlargement of the Police Bureau of Crime Prevention and its consolidation with the Police Women's Bureau, based on detailed findings of a National Youth Administration project engaged in by Cleveland youths. Frank W. Baldau, District Supervisor for NYA, says this is the only project of its kind in the United States. Detective Lewis Mead has represented the Police Department in conducting the survey, on which 177 young women and 165 young men are employed. The enlarged bureau would place a member of its staff in every neighborhood where the NYA survey shows one is needed.

The chief emphasis of the survey has been placed on a study of juvenile delinquents. Data concerning them have been obtained from the Juvenile Court, the Court's Detention Home, the City Bureau of Vital Statistics, the Board of Education, the Municipal Court, the Police Automobile Theft Bureau, the Traffic Court, the Police Record Department, and the Department of Criminal Identification.

The survey indicated that practically all major crimes in Cleveland are committed in the age bracket of 14 to 28, with those in the upper part of the bracket possessing, in almost every instance, previous records of crime and anti-social behavior.

ROBERT W. CHAMBERLIN,
Assistant Director, Department of Public Safety, Cleveland, Ohio.

Chief Tells Radio Public About Fires

FOLLOWING every fire in a building in Rochester, N. Y., Chief C. E. Ginther broadcasts from the local radio station the name of the owner or tenant with a description of circumstances surrounding the fire-cause and measures which would have prevented it. The Chief reports that this form of publicity has promoted an attitude of carefulness in Rochester. The city has a low fire-loss record.

Building Plans for Duluth Firemen

THE Duluth, Minn., Fire Department is placing on cards the floor plans of all buildings in the congested district. WPA workers obtained the data under the direction of Fire Marshal Peter Ward. These cards will be furnished to all fire companies for their guidance during fire-fighting operations and will be kept up to date by officers and firemen in their inspections of the buildings.

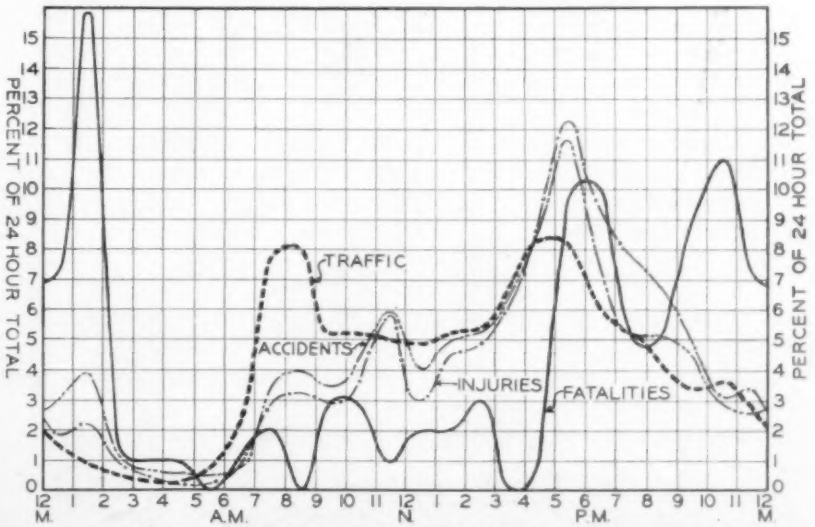


CHART SHOWING THE HOURS AT WHICH TRAFFIC ACCIDENTS OCCURRED IN SEATTLE, WASH., IN 1936

Compare the fatality curve with the curve of traffic volume, especially from 8 P.M. to 2 A.M. This is death time, yet traffic is lightest

NOTHING TAKES THE PLACE OF WATER

NOTHING TAKES THE PLACE OF CAST IRON PIPE

WATER is indispensable to human existence—cast iron pipe is indispensable to long life and economy in an underground main—nothing takes their place. Great progress has been made in the purification and distribution of water supply, as well as in the manufacture of cast iron pipe.

If you demand *proved* long life and low maintenance cost that result from effective resistance to corrosion—assured safety margins for impact, beam load and crushing stresses—and permanently tight joints—then you will agree that *nothing takes the place of cast iron pipe.* Some materials meet some of these requirements but only cast iron pipe meets them all.

CAST Q IRON

Look for the "Q-Check" registered trade mark.
Cast iron pipe is made in diameters from 1¼ to 84 inches.

THE STANDARD MATERIAL FOR UNDERGROUND MAINS

To replace another material, Miami installs a cast iron water main that will serve for a century or more. And they are not guessing. The long life of cast iron pipe is proved by history.

THE CAST IRON PIPE RESEARCH ASSOCIATION, THOMAS F. WOLFE, RESEARCH ENGINEER, 1015 PEOPLES GAS BUILDING, CHICAGO, ILLINOIS

When you write for that catalog, kindly mention THE AMERICAN CITY.

MAY, 1938

Vol. LIII, No. 5

The American City

470 Fourth Avenue
New York

35 Cents, $2 a Year

Wise Public Spending Involves Careful Planning

THE best way to restore confidence and to create permanent business prosperity is for every employable person to be assured of a steady job at an adequate wage.

Private industry cannot give, and never has been able to give, this assurance. Governmental agencies must be prepared with a well-planned, flexible program of public works and services, which can be expanded as private industry contracts, and contracted as private industry expands. Public borrowing and taxation ought also to be adjusted to the business cycle; loans to be greatest when business is worst, and taxes to be greatest when business is best, so that public loans may then be reduced.

In a memorandum submitted to President Roosevelt on April 8 by a special committee of the United States Conference of Mayors, it was stated that:

"It is our judgment that it will be necessary for the Federal Government to give work, during the next fiscal period, to 3,500,000 needy unemployed. This will require an appropriation of approximately *three billion dollars*. It is to be hoped that the Congress will authorize an appropriation in the above amount, in order that a planned program for the full twelve months may be carried out.

"We again repeat that we feel it is the responsibility of the states and localities to provide aid to the unemployables and that Federal funds should not be made available for direct relief to the unemployable group. There are some who would have the Federal Government do it all, but we do not subscribe to that viewpoint, and in this connection it should be pointed out that cities are not only carrying the direct relief load but are also making substantial contributions to the Federal WPA program."

This statement was signed by the following Mayors: F. H. LaGuardia of New York City; Harold H. Burton of Cleveland; Daniel W. Hoan of Milwaukee; Bernard F. Dickmann of St. Louis; Maurice J. Tobin of Boston; Ross D. Rogers of Amarillo; Joseph D. Scholtz of Louisville; R. E. L. Chancey of Tampa.

Wise spending involves careful planning. Merely to create jobs in order to take up the slack in private industry is not enough. The economic and social values of every project must be considered in relation to its cost of construction and maintenance, its design, its location, and its place in a long-term program of public improvements.

THE AMERICAN CITY believes, as do many outstanding economists, that such a public policy would produce an increase in the national wealth much in excess of its cost. It would utilize the main factors which can create such increased wealth—man-power, machinery and facilities which would otherwise be idle or inadequately used.

That American private industry has benefited to the extent of $1,833,113,302 worth of materials and equipment ordered for Public Works Administration projects between July 1, 1933, and December 15, 1937, is shown in a report just issued by the Bureau of Labor Statistics of the Department of Commerce. Iron and steel and their products, and stone, clay and glass products, were shown to lead the field in the amount of orders placed. Not including machinery orders, $503,211,414 was spent with industrial concerns supplying iron and steel and their products. Machinery concerns received orders totaling $313,871,874. Orders for $527,491,415 were placed for stone, clay and glass.

Study of the PWA program by the Bureau has disclosed that PWA lifted a number of key industries from their depression stagnation, in addition to vast pools of employment created "back of the lines" in industry, directly attributable to PWA project construction. Analyzing the employment effects of PWA, the Bureau found that two-and-a-half times as much work was created in private industry supplying materials as was created at the actual construction sites.

In the municipal field a wide variety of projects should have careful consideration to determine which of them, in any given community, best meet the tests above suggested. Since the perfect city has not yet been built, every municipality should be able to select worth-while projects from such a list as: water works and sewage-treatment plants, street paving and lighting, parks, playgrounds, swimming pools, bridges, viaducts, grade-crossing elimination, garbage incinerators, fire-fighting apparatus, police radio, low-rent housing developments, traffic signals and parking meters, airport improvements, shade trees and community forests, schools, libraries, hospitals and other public buildings.

There are ample opportunities for public spending—national, state and county, as well as municipal—which would enhance the general welfare, health, happiness, and prosperity, not only without injury to private industry, but greatly increasing the demand for the products and services of private industry.

(*See also page* 103)

Municipal Asphalt Plant a Wise Investment

Experience in Knoxville Shows Savings in Resurfacing and General Maintenance Costs

By HAL H. HALE
Formerly City Engineer, Knoxville, Tenn.

DURING the depression years the city official responsible for the maintenance of streets had a very difficult job on his hands. To keep the streets in a passable condition on the limited budget available was a serious problem. Even during good times it was often difficult to secure sufficient maintenance funds, for the average citizen, and some of those responsible for the budget, accept the term of "permanent paving" literally.

The city of Knoxville has approximately 125 miles of "permanent" type street paving out of a total of 450 miles of streets. These types vary from a small amount of brick surface, to Granitoid block types, concrete, Trinidad asphalt, asphaltic concrete and the later oil asphalt types. Some of this paving dates back to about 1900 and there are some streets, with the exception of the oil asphalt types, that are thirty years old. The larger amount of paving is asphalt type, with the maintenance of which this article will deal.

Contract Maintenance

It is probably a safe rule to apply that $300 per mile should be the minimum amount set up for the maintenance of street surfaces, and in many cases this is insufficient. During the depression years of 1931, 1932 and 1933 practically no maintenance, other than emergency work, was done in the city of Knoxville. Appropriations had been cut to the bone and no contracts for street maintenance were let at any time. Prior to 1931 it had been customary to award each year a contract for the patching of asphalt streets, the price based on the cost per square yard, which included the removal and disposal of old surface and replacement of the new, and on a depth of 2 inches and under in the finished patch. The cheapest price the city had ever had on this type of work was $1.49 per square yard. In 1934 an amount of approximately $15,000 was set up in the Service Department budget for the maintenance of paved streets. It can readily be seen that this amount was inadequate even in a normal year; still more so in one following a three-year period in which practically no maintenance work had been carried on.

Complete Plant Purchased

Many contracting concerns went the way of receivership and bankruptcy during this trying period, and the city of Knoxville found it could buy, in a liquidation sale, an asphalt plant and equipment formerly used by a local contractor. This equipment included a Hetherington and Berner asphalt plant with tanks, pump, pyrometer, etc., in fairly good condition, miscellaneous surfacing tools, firewagon, an 8-ton tandem roller, and other miscellaneous equipment. Even with the small amount of money available in this year for street patching, it was decided that it would be good business for the city to buy the plant, and this was done. The plant and equipment erected and in operating condition cost the city approximately $6,500, which was taken from our already meager appropriation

RESURFACING NORTH BROADWAY IN KNOXVILLE, TENN.
Left—Method of packing old car rails and placing binder course. Right—A section of finished paving in the background

BINDER COURSE IN PLACE ON NEW WEST FIFTH AVENUE BRIDGE IN KNOXVILLE DURING SURFACING WITH MATERIAL FROM MUNICIPAL ASPHALT PLANT

of $15,000. This proved to be one of the best investments in street maintenance the city ever made. We were fortunate in having in our Engineering Department a man with long experience in asphalt work, who could take over the operation of the plant.

Plant Proves Blessing

During the first year of operation out of the small amount of funds available approximately 835 tons of asphalt mixture and 208 tons of binder were laid at a cost of approximately $9,200, and by virtue of a contract for the maintenance of state highways through the city, $814 was collected from the state of Tennessee. In 1935 the city had approximately $25,000 set up for the maintenance of paved streets. During this year the city laid a total of 28,697 square yards of sheet asphalt patching at an average cost of $0.5386 per square yard. The asphalt weighed an average of 147.37 pounds per square yard and had an average depth of 1½ inches, and the cost per ton of material laid was as follows:

Cost of binder per ton—		
Laying cost	$2.322	
Plant cost	1.387	
Material cost	1.903	$5.612
Cost of asphalt per ton—		
Laying cost	$2.594	
Plant cost	1.522	
Material cost	3.188	$7.304
Cost of asphalt per square yard—		
Laying cost	$0.1913	
Plant cost	0.1122	
Material cost	0.2351	$0.5386

A breakdown of the plant cost per ton of asphalt was: fuel (coal), $0.4222; power (electricity), $0.160; depreciation, $0.168; and labor, $0.772. This amount of maintenance work cost $21,207.63. There was collected for outside work done for the state and others the sum of $11,000. In the year 1936 approximately $41,000 was set up for maintenance of paved streets, and a total of 51,470 square yards was laid, or 3,217 tons, of asphalt and 2,566 tons of binder. The unit cost per ton was $8.061, or a rate of $0.5038 per square yard of material laid. In 1936 the cost per ton of material laid was as follows:

Cost of binder per ton—		
Laying cost	$1.064	
Plant cost	1.489	
Material cost	2.309	$4.862
Cost of asphalt per ton—		
Laying cost	$3.332	
Plant cost	1.489	
Material cost	3.240	$8.061
Cost of asphalt per square yard—		
Laying cost	$0.2082	
Plant cost	0.0931	
Material cost	0.2025	$0.5038

The average weight of the asphalt per square yard was 125 pounds, and the average depth was 1¼ inches. A breakdown of the plant cost per ton for asphalt was: fuel (coal), $0.3555; power (electricity), $0.160; depreciation, $0.168; labor, $0.8055. The work during 1936 included all types of work, from the thin skim-patch type to regular surfacing work.

Resurfacing Project

It may be of interest to note the cost of these various types of work. One street known as North Broadway was resurfaced over the old car line with a total of 21,400 square yards of asphalt laid. This included 992 tons of sheet asphalt and 1,196 tons of binder. The cost of the binder per ton in place was $5.036, and the cost of asphalt per ton was $6.027, the average cost per square yard for all material being $0.561. In the resurfacing work on Broadway the binder was laid in the customary manner over the old surface of the car tracks, after having first applied paint coat on the old asphalt over the car rails. This was done to even up the depressions and true up the surface, and also to prevent the later appearance of rail marks through the surface. It has since been found that this treatment was most successful.

It may be of further interest to note a surfacing job on the new Hill Avenue Bridge wherein asphaltic concrete was used rather than the customary binder and sheet asphalt surface. In this case a total of 4,238 square yards of asphaltic concrete was laid at a unit cost of $0.469 per square yard, or a price of $5.632 per ton.

Skim-Patching

Another and different type of job was skim-patching work on what is known as Cumberland Avenue, on which no binder was used owing to the small amount of funds available. In this case the sheet asphalt was first tamped in the rail grooves, and then later the sheet asphalt surface was placed for a distance of about 18 inches outside the old rails. The thickness varied from 1/16-inch to 1½-inch. The asphalt was laid over a paint coat binder in most places. A total of 5,911 square yards was laid at a cost of $0.339 per square yard, or a cost of $8.779 per ton. It will be noted that this ton price is higher than that of the Broadway work.

Municipal Plant an Asset

The above summary of 1936 shows the typical costs for various types of work which has been done with our plant and also shows the economy of such operation. The cash income for the plant in 1936 was $11,198. It will be seen

from the operation in 1935 and 1936 that an income can be had from this plant, if it is properly managed, of approximately $10,000 per year, which is of material assistance in the street maintenance budget.

From experience with the asphalt plant operation it can be said that ownership and operation of the municipal asphalt plant in the city of Knoxville is a distinct asset. Where previously we paid not less than $1.49 per square yard for this type of work, our cost under city operation has never been higher than $0.56 per square yard. This is an item to be given serious consideration with restricted budgets for street maintenance. No effort has been made, in keeping the cost of our plant operation, to misrepresent costs in any way. We have tried to set up a fair cost sheet, including all items that can properly be charged to such an operation, and we feel that the ownership and operation of a municipal asphalt plant is certainly a wise investment for the city of Knoxville.

New Elevated Water Storage at Jackson, Mississippi

Tank Cuts Pumping Costs, Improves Pressure, and Is an Attractive Landmark

JACKSON has just recently completed the erection of a new 500,000-gallon elevated water tank which, because of its visibility from one of the city's principal traffic arteries and from a main highway entering the city, and because of its outstanding painted design, has become a prominent landmark in the city.

The tower is situated less than a mile from the municipal airport. In compliance with U. S. Government requirements, it has been painted in a bright International orange and white checkered design and equipped with signal lights at night in order to prevent it from being a hazard to air navigation.

Although quite conspicuous both day and night, the orange and white checkerboard effect has not proved displeasing, as first anticipated, and has evoked little criticism. It has, however, been the subject of much publicity and comment from citizens and visitors because of its outstanding design, one local newspaper columnist jokingly offering to arrange a giant checker game on the tank between the Mayor and Commissioners.

Instead of becoming a hazard to flying, the tower has proved to be an asset because its prominence and 24-hour visibility enable the nearby airport to be more easily located by pilots in bad weather. Local pilots use the tower as a pylon to circle in taking up local passengers for short flights.

NEW 500,000-GALLON ELEVATED TANK AT JACKSON, MISS.

Improved Water Pressure

The new tank and tower was erected in the western residential section of the city, where the need for a greater and uniform water pressure had existed for some time, to insure better fire protection. The resulting stabilization of water pressure even during peak periods of use, and the protection afforded, have been highly pleasing to all citizens.

The difficulty and expense of designing and building a high water tower in a residential section that would harmonize with adjacent homes and other buildings, without calling forth objections from affected citizens, was obviated by locating the tower in nearby Livingston Park. This park comprises some 150 acres, part of which was sufficiently elevated to provide an ideal site. The site in the park selected was about 15 feet lower than other possibl sites, but was well set back from the street and nearest residences and at the rear of a suburban business section. Intervening trees and business houses hide the lower part of the tower, so that all views of the tower are from a distance and do not detract from residential property values.

Although erected primarily to insure an ample and uniform water pressure in the western part of the city, since the erection of the tank it has been found that pumping costs at the water plant have been reduced approximately $300 per month. It is estimated that within ten years the savings effected will have paid the entire cost of the tank and tower.

The radial cone tank is of the straight shell type and is supported on eight steel I-beam columns. The height from the base to the bottom of the tank is 90 feet; from base to top of tank, 122 feet. Elevation of water is controlled by a Golden-Anderson altitude valve which is connected with a 12-inch supply main. The radial cone bottom tank was furnished and erected by the Chicago Bridge and Iron Co.

Clean Flushed Streets
An Aid to Community Health

By ALFRED LAWRENCE
Mayor, Lawrence, Kansas

CLEAN streets mean better health for the community, cleaner stocks of merchandise, and less dust in the home. They also serve as a stepping-stone to personal cleanliness of both body and mind.

Lawrence is a city of 14,000. The University of Kansas, with 5,000 students, is located here, and our authorities are vitally interested in the health of this center of education.

There are 55 miles of paved streets in the city. Five miles of these are state highways. The streets are divided into two classifications—congested business district, and residential districts.

We believe that the clean flushed streets in Lawrence are a good advertisement to passing motorists; telling them forcefully that our town is a progressive and live community and that we take an interest in municipal housekeeping. Much has been discovered in recent years about the sensitivity of individuals to pollens and dust, and we believe the health of our community is benefited greatly by having flusher equipment in the Street Department.

Flusher a Great Aid

Our Street Department had a real problem in trying to remove dust and other refuse from the streets with the sweeper system only. Some twelve months ago a 1,500-gallon power flusher was purchased from E. D. Etnyre & Co., of Oregon, Ill, and added to the equipment for street cleaning. This seems to have solved our problem in a big way by getting rid of an accumulation of fine flying dust and refuse on the pavement.

With the power flusher, with a pressure of 70 pounds at the nozzles, all dust and grime, which is more or less germ-laden, is thoroughly washed from the street surface, even from under cars parked at the curb, and carried away through the storm sewers. This is all accomplished in one operation, which prevents the dust from blowing around and being deposited in stores and other places.

Advantages of Flushing

We find the power flusher to be the most sanitary and economical method of street cleaning. The greater part of our street cleaning is done by this method, which has proved very successful and has been extended throughout the city. Naturally, it will be concluded that large quantities of water must be used for street-cleaning purposes, but our experience has shown that after the streets were thoroughly cleaned by the flushing method, later cleaning required one-half the volume of water to keep the streets clean.

One would suppose that the flusher method would be useless in winter use, but in this part of the United States, where the winters are not severe and the streets are often covered with slush and slime from melting snow, it is possible to remove this coating with the flusher before it becomes dry; therefore clean streets are obtained much earlier than with sweeper equipment.

Another question regards the stoppage of sewers when large quantities of dirt and rubbish are washed into them by the flusher method. In our experience there has been no trouble whatever. Such dirt and rubbish as reaches the sewers, carried by flushing water, appears to be of no consequence when controlled by proper operation of the flusher. Our sewer inlets are provided with catch-basins which are easily cleaned. By keeping the streets clean with the flusher, we wage a year-round battle with dirt and rubbish and avoid heavy expense during the spring clean-up week, which means the advantage of clean streets the year round in place of the once-a-year clean-up.

FLUSHING UNDER PARKED CARS ON THE MAIN STREET OF LAWRENCE, KANS.

Costs

Our city is second class, under the council form of government. State budget and limited taxation laws compel us to handle the street cleaning work in an efficient manner. The street cleaning personnel is tied up with the Street Department, for which a budget is set. The council is divided into committees, and the street committee is made responsible for the direction of the cleaning of the streets.

We find, after keeping accurate records, that the cost of the flusher is not great. The municipal water plant furnishes the water at a cost of 12 cents per thousand gallons. The records show that one 1,500-gallon tank of water will flush one block in the business district, 700 feet long by 68 feet wide, with the machine moving at the rate of 8 miles per hour. This means a cost of 18 cents per block, and we usually flush in the main business district about three times per week. Two men are required to operate the flusher, one man usually taking care of any rubbish that may have accumulated in the gutters; thus the streets are quickly cleaned.

In the residential district, one 1,500-gallon tank of water flushes about four blocks of streets, 30 feet wide, in one operation. Naturally, the interval between the cleanings of the residential district is greater than the interval between the cleanings of the business district, but sufficiently short, however, to keep the streets in a clean and sanitary condition.

In the final analysis of costs for operating the flusher, gas, oil, repairs, depreciation and man-power must be considered in the cost of cleaning the streets. Our experience here has placed this cost at approximately $2.54 per mile of clean streets.

TVA and the American Dream

An Editorial from The New York Times, April 18, 1938

TO many newspaper readers the great experiment on the Tennessee River which we call for short the TVA has come to mean controversy. Disputes over the power policy and the split in the directorship which led to the Presidential dismissal of Chairman Arthur E. Morgan have demanded the headlines. Some of us are compelled to believe that the hydroelectric "yardstick" has been too belligerently used and that subsidies, open or hidden, have impaired its value as a measure of possible rate reductions under competitive conditions.

But surface questions of TVA policy should not lead us to overlook the seven-eighths or so of solid achievement which ride, like an iceberg's bulk, beneath the surface. Russell B. Porter's recent contributions to the daily editions of *The Times* and to *The Times Magazine* reveal how much is being done with which no one can quarrel. The American genius is much the same, whether its pay check is governmental or private. When it has a chance to build it builds well. To a certain extent the relative prosperity of the Tennessee Basin is artificial, since its immediate source of supply is Federal money, which the taxpayer must sooner or later repay. But there is nothing artificial, inflationary or phony about the gigantic plan for flood and low-water control, now partially realized; about the four completed dams, the three that are under construction or the four which are proposed; about the fertilizer program and the conservation program with which it is linked; or about the patient attempts that are being made, not to bully the valley people into a dictatorial lockstep but to educate them, learn from them and work with them.

We may have our opinions as to the proper relationship between the private and public distribution of electric current, but we cannot doubt that the increased use of electric power, both private and public, is a good thing. We may be skeptical about a "planned economy," but not about the terracing and planting of hillsides against erosion. We do not want our farmers to be governed by orders from Washington, but we can rejoice when they see their own advantage in replacing hillside corn fields with soil-saving vetch or clover. We can be glad when a "demonstration farm" works so well that the neighbors go home and do likewise. We can be happy in a perfectly non-partisan way when we see diversified crops growing on what used to be one-crop farms, when we see whole communities improving in health under a more varied diet, when we see the work of farmers and farmers' wives lightened, when we see waste prevented by modern electrical machinery and modern refrigeration. There are good and bad sorts of paternalism. The wise parent teaches his child to be self-reliant. We need not fear paternalism of that sort.

This spring and summer the TVA will come under the exhaustive scrutiny of a Senatorial investigation. Some further doubt may be cast upon its power policy. The Berry marble claims may also be revealed in an unflattering light. But it seems certain that what the TVA has done in the way of education, of patient cooperation, in the kind of planning in which every individual and every neighborhood is respected and has a voice, will stand up.

The basic issue is not between private enterprise and public enterprise. It is between enterprise that encourages local and individual initiative, responsive to the general well-being, and enterprise that does not. Many of the things that TVA has done, as well as many of the things that the private power companies have done, meet the social test. No one agency can realize the American dream. Private and public agencies can both work toward it.

Mechanized Accounting Aids for Municipal Utilities

"More an Engineering Than an Accounting Problem"

By G. WARD YEOMANS
Utility Engineer; Barker & Wheeler, Engineers, New York City

IN many fields where the engineer might not be expected to work, great improvements can be traced to his methods and devices. Conspicuous advancement in the practice of surgery and medicine have been brought by the engineers and engineer-scientists with thermometer, microscope, X-ray tube, inhalator, respirator, pulmotor, electrocardigraph, audiometer, and other mechanical aids. So too in utility accounting the most radical improvements in procedures have come from the engineer's adaptation of machines and mechanized routines to reduce hand operations and mental gymnastics. Few people any more will claim great spiritual values for employee or employer from tedious hand copying and distributing of involved comparisons of mental or scratch-pad computations. Mechanization nearly eliminates the old hand analyses, summaries, break-downs, re-summaries and re-capitulations. It vastly reduces the chances for error, makes easy the checks against error, and generally increases certainty and speed. It takes away a lot of the old drudgery associated with keeping books and making up statistics. Not only do the employees in an office where mechanized methods prevail accomplish much more in less time, but they understand better the aims and principles underlying the accounting operations.

With all electric utilities, the trend has been for state and Federal regulatory bodies to require more and more detail in revenue, expense, and capital accounts, and ever more statistics. This has gone on until now new methods are imperative to produce the results at all, to say nothing of doing so without unreasonable delay and burdensome expense. Office machines and mechanized routines are equally applicable to municipal utility departments as to private corporations. The relative extent of possible improvement is usually greater in municipal utilities, since *in the great majority of these departments the accounting and statistical methods are wholly inadequate for a healthy business.*

Municipal Utilities Regulated

Until a few years ago, most municipal utilities were able to escape the detailed requirements placed on privately-owned concerns. But the situation now for the municipal gas and electric utilities has changed greatly all over the country. Due to recent regulatory legislation in various states, to the example of stipulations accepted by municipal customers of the TVA, to the expanding activities of the Federal Power Commission, etc., further requirements can be expected rather than fewer. All this has plunged many municipal electric utilities into a maze of accounting requirements with which most of them are totally unfamiliar. Municipal water departments are comparatively unconstrained as yet, except that state health departments keep check on the quality of their water and the adequacy of their service. But inevitably their turn is coming for a degree of control as great as that now placed on municipal gas and electric companies. *It would be wise for the municipalities that have to put their electric utilities on a sound business basis to apply the same reorganization to water departments.*

Wanted: More Accounting and Statistical Detail

Some of the managers of municipal electric utilities whose actual accounting in the past has been limited to booking cash receipts and disbursements, and perhaps keeping some rudimentary sort of customer ledger, have regarded this new regulation as imposing an undue hardship and unnecessary expense. For the most part such resentment against this mild form of regulation has come from those who have interpreted "home rule" to mean "do as you please." Fortunately, however, most of the boards of direction and managers have realized that they had long lacked knowledge of the detail of their utilities' affairs needed for their most intelligent administration and control. With them the problems have been as to how they could quickly meet the new requirements, and create the detailed records without wasteful and time-consuming experiments and without jumping the expense of accounting and statistics to a point where it would be so top-heavy as to affect seriously the business condition of the utilities.

The smaller municipal electric utilities have solved this problem by the use of standardized journals and ledgers (reduced to simplest essentials but nevertheless complete), a work-order plan and perhaps a perpetual plant appraisal, card index sets for unstable property items and material stores, a better meter-reading plan, a small general-service computer, an adding-listing machine, the ever present typewriter of course, an addressing machine for customers' bills, and sometimes one of the less expensive combination machine-billing and customer-record outfits. But most of the general accounting entries can retain hand posting until the size of the utility corresponds with a gross revenue of, say, $30,000 per year. This sum does not mark a definite line of differentiation but is a hazy point within a zone where it is an open question whether mechanization is to proceed further or not.

The larger municipal utilities have solved their problems along much the same lines but replacing hand operations by various machine aids. Most important of all is

their use of a rather expensive all-purpose bookkeeping machine which can be used at one time for the simultaneous production and checking of general, or detail, ledgers and journal sheets. This machine at another time keeps up the work-order posting, and it can be used on the control of material-stores records. One of its most important uses is to produce and check simultaneously the consumers' bills and monthly consumer ledger. Where one of the bookkeeping machines comes in, often the little general-purpose simple computer blossoms out into a motorized, semi-automatic, add-subtract, multiply-divide unit.

What Machines?

Unfortunately there is no ready-made array of machines or "system" of routines that will fit any and all municipal utilities like a new suit off the shelf. This is because of essential differences in location, in climate, in physical characteristics of the property, in consumers and in personnel between the cities and villages owning electric systems. A study has to be made of each individual case and a balance found between hand work and mechanized routines. The list of machines needed depends on that plan.

Therefore, it becomes more of an engineering than an accounting problem finally to secure accurate, adequate, dependable records without unnecessary effort. The accountant must re-educate himself in terms of new phraseology and simpler, direct methods. But the engineer must work with him to report facts of physical changes in the property and in related costs. The engineer must develop the method whereby the facts about operating expenses are secured from the field and delivered in usable form to the accounting department.

Meter Reading and Billing

The various prescribed uniform systems of accounts require much detail of revenues. There must be a complete segregation of kwh sold with related dollars by class of consumer; the Federal Power Commission also requires for its various reports a breakdown of kwh and dollars by consumer class and rate steps. This revenue accounting is one of the first procedures where machines save time and effort. Some fair-sized utilities still use a hand-posted customer's ledger and longhand bills; a clerk takes the meter books from the meter readers, subtracts the readings to get kwh used, computes the amount of the bill, posts this to a consumer's ledger page, and then writes out the bill and addresses it. Here are unnecessary copy operations, head work, and a complete lack of automatic proof of computations or postings. Billing, then, is a monthly season of torture, and chances multiply for errors not discovered until the customer complains. Here any of the several available machine methods is a help.

One plan provides an individual ledger card for each consumer, carrying a complete record for about four years with the liquidations. The posting is a machine copy by-product of printing the bill. This plan does not provide an easy analysis of kwh by rate steps in all classes, thereby for some people offsetting the consolidated history of the consumer's use given by the ledger card.

Another plan, using a so-called "Stub Ledger," creates each month a new customers' ledger which is only a register file of extra stubs printed along with the bill. This plan does not furnish the easiest kwh analysis and mechanical proving; the file of stubs is somewhat cumbersome, and there is no consolidated history of consumers' use. There can be mechanical checks on accuracy.

A third plan is rapidly rising in use—the so-called "Consumer Register" plan. With this, the consumers' ledger is built up of loose-leaf monthly register sheets each accommodating from 50 to 100 accounts. Before a billing period starts the register sheets are made up with the consumers' names, addresses, and account numbers printed on them from the addressing machine stencils or plates just as used for the bill itself. This listing on register sheets can be done at the rate of about 65 accounts per minute including time for change of sheets and stencil plates—almost as fast as preparing bill blanks.

This register sheet matches up with the spacing of the bill itself so that the register is written up as a carbon-copy when the bills are written. The prepared register sheet with a copy carbon sheet in front is inserted in the billing machine, and the prepared bill blanks, with consumers' names in the same sequence as on the register, are semi-automatically fed into the machine opposite the proper space on the register. Present and previous meter readings and consumption are printed in on the bill and carry through to the register sheet. The charges, discounts, and arrears are written into the designated places, and the total due is computed mechanically and extended. The machine gives a positive mechanical proof that meter readings and consumption have been properly transcribed and computed. Such a mechanical audit automatically localizes any errors made by the operator and eliminates checking by the revenue clerks.

Separate totals of consumption, charges and arrears are automatically accumulated and can be cleared at the bottom of each sheet or at the end of each reading route. The arrears must agree with the outstanding arrears control in the ledger account. A complete analysis of sales by various rate schedules or classes of service is made up from the register sheets, showing number of bills, units of consumption and money, by rate steps, and this becomes the basis of the monthly revenue report. This not only mechanically proves up the billing as a whole but gives a file of data invaluable for rate studies.

Where the work is sufficient, a single-purpose billing machine may be an economical investment. Where the machine cannot be continuously employed on billing, an all-purpose bookkeeping machine is better used—shared between billing, fixed-capital records and general-ledger accounting operations. There are several makes of machines which can serve on billing and general-service work, and all cost approximately the same. There is a still greater variety of equipment for single-purpose billing machines which may be considered if the municipal utility is large enough to keep this machine fully occupied as well as another, an all-purpose machine, engaged on general accounting.

Helping the Meter Reader

Much study and trial has been given to the subdivision of consumers by districts, routes, and ledgers for economy in reading, billing, discount dating and ledger control. Any successful plan must be flexible enough to permit necessary changes from time to time without need for re-

numbering the consumer accounts. The most practical scheme so far developed divides the consumers into routes representing a day's reading or some easy fraction like a half or third of a day. Routes are combined into districts representing a day's billing. Each district should have a definite number which can govern the permanent discount date for consumers in that group. The renumbering of consumers' accounts to accommodate growth can be eliminated for a long period of years by assigning a separate series of account numbers to each district and using at first only each fifth or tenth number in the series, like 5, 10, 15, 20, or 10, 20, 30, 40, as the outlook warrants. This gives formidable-looking account numbers, but that is no disadvantage since they are always printed from addressing-machine plates or stencils.

This register style of consumers' ledger seems to lack only one desirable feature—the summary on one sheet of a year or two-year use history (only figures of course) for each consumer's account. The number of occasions for referring to this are few, however, and a year's file of these registers can be kept close to the public counter so that, in case of need, the history figures can be scanned or copied out with only a few minutes' delay. The advantages of smoother and quicker revenue-accounting are effective all the time, all the way up after the billing and paying operations, and outweigh any minor and apparent disadvantage.

The meter readers' sheets should provide at least one year's record and preferably two. There should be spaces for several changes of names and meter data to eliminate opening a new sheet each time a customer moves or a meter is changed. These provisions can all be secured without making the book too big and clumsy; an oversized book is something to guard against. The meter reader should subtract readings and show consumption before he leaves a consumer's premises, which he can do without appreciably slowing up his travel. This practice eliminates many special trips for re-readings and verifications and reduces high-bill complaints, for if the consumption shows unseasonable variation from previous figures shown on the book, the reader will immediately verify his reading or correct it. This computed consumption gets a mechanical check when the bill is written by the billing machine.

The Bookkeeping Machine on General Accounting

Old-school accountants naturally prefer the hand-written journal with hand postings to ledger accounts. The advantage is that the journal gives a complete accounting history of each day's activities, and the ledger entries can be abbreviated. Machine accounting has made it possible to eliminate the separate journal write-up but still to secure exactly the same results. The new machine routine posts the entries to the ledger accounts and produces the journal sheet as a by-product of the same operations. There can be any desired degree of expansion from a general-ledger control account to sub-ledgers with the same results.

The ledger cards can be laid out to serve all classes of accounts, and they have their various columns match up with corresponding columns of the journal sheet. The operator places a journal sheet in the machine with a sheet of copy carbon in front. The ledger card or sheet being posted is slipped in another feed channel and adjusted to the line of posting. The account's previous balance is entered on the adding keys and can be accumulated in an adding register if desired. The date key can be either operated manually or be made to print automatically, and the posting reference recorded; then the detail notation of the entry is typed and the debit or credit entered in the proper column. While this has been done, with some machines, the new balance has been accumulating in a cross-footing register, and this new balance is next mechanically proved; if the entry has been correctly made and proved, the cross-footer can be cleared and the machine is ready for a new ledger card. In other machines the new balance in the cross-footing register is printed by depressing a balance key a second. A second pickup of the old balance together with the accumulation of the various registers for debits, credits, new balances, proves all factors of the work done. The operator can check the accuracy at any time during the run by sub-totaling the registers. Total postings of a particular kind can be accumulated for carrying to control accounts. Any reasonable number of journal sheet copies can be produced for different offices or departments.

This machine is of great importance in the handling of a continuous-property record or perpetual inventory of fixed capital. Such a system following what seems the best plan, for small and medium-sized utilities at least, is essentially only a highly detailed sub-ledger with a separate card for each typical kind of property unit. The large amount of posting is well done and completely proved up with a machine such as described.

Where the utility is large and each machine and operator is engaged continuously on similar records, the operators become highly skilled so that some short cuts can be employed—like omitting the individual entry proof and scanning for discrepancies. The type of machine to be used then may also change from that which would be used by a general-service operator on multi-function jobs.

Attention has here been directed particularly to those office machines which up to now have been little employed by municipal utilities. But this does not mean that the savings from the liberal use of more familiar equipment, which amount to considerable in the aggregate, should be forgotten. This would include automatic dating stamps, motorized adding-subtracting (listing) machines, motorized calculating machines of either ordinary-control or semi-automatic types, envelope sealers, bill and letter folders, and mimeographs.

A Vast Market for New Homes

INDICATIONS that American cities probably have a vast market for new homes which has not been fully exploited are seen in a report made available to the Federal Home Loan Bank Board by the St. Louis Chamber of Commerce.

An intensive survey of the St. Louis market by Henry O. Whiteside, the Chamber's Director of Research, showed that apparently there were at least 16,933 families in the Missouri metropolis ready to make down payments of $15,987,000 to finance homes. Officials found nothing to indicate that a similar demand does not exist in other cities, because the St. Louis real estate market presented no outstanding peculiarities. The St. Louis survey was based on a questionnaire mailed out to several thousand persons believed to constitute a cross-section of St. Louis' population.

Elevated Highway Design for Speed, Safety and Beauty

By V. G. IDEN
Secretary, American Institute of Steel Construction, Inc.

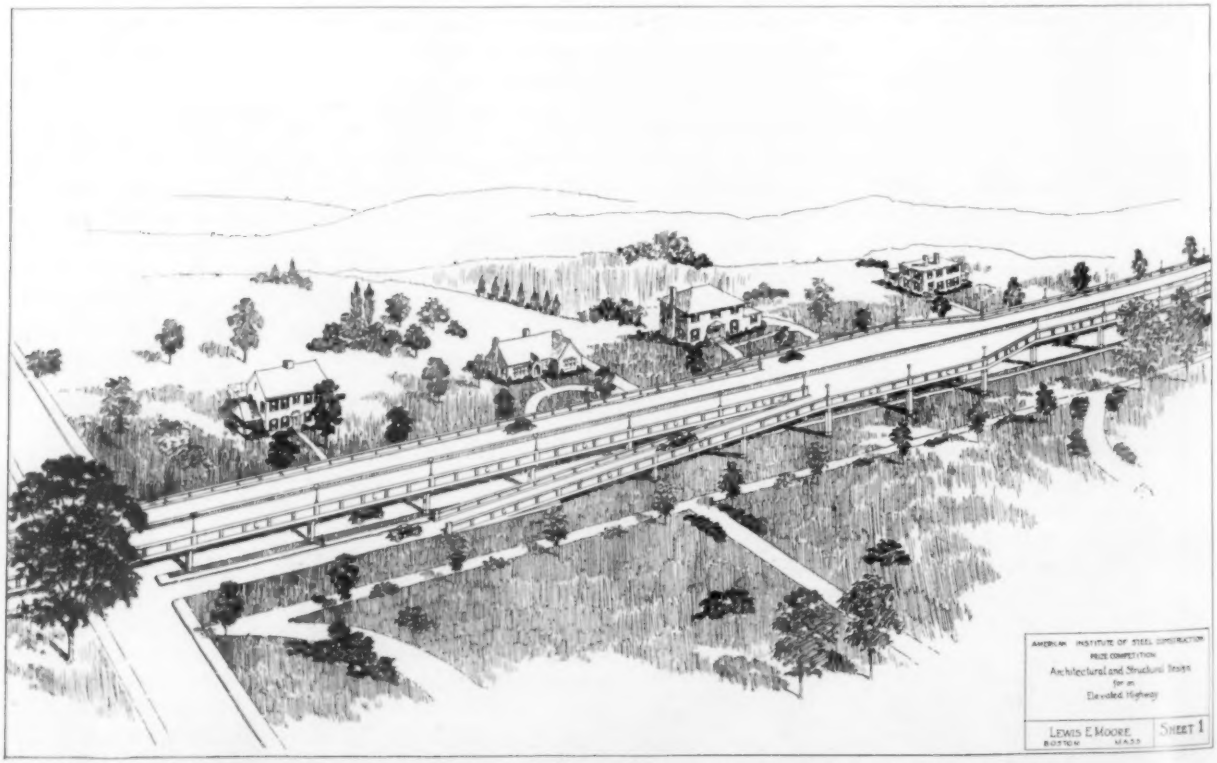
ELEVATED highways to relieve congestion and to speed the flow of traffic through densely populated cities can be designed not only economically but esthetically. This was proved by the 273 designs submitted in the competition just held by the American Institute of Steel Construction. Leading architects and engineers of the United States and foreign countries joined in submitting ideas, many of which would contribute added beauty to some of our present city boulevards.

The first prize of $5,000 goes to Hazelet & Erdal, consulting engineers, of Chicago, Ill. Theirs was a streamlined design supporting a four-lane roadway upon a cantilevered floor beam supported on a central bent, the spread of the legs of which is sufficiently close not to impinge upon the street below, but forms a center safety zone upon it. Such a design, it was felt, could be erected without causing consequential property damage and without impeding traffic on the underlying street.

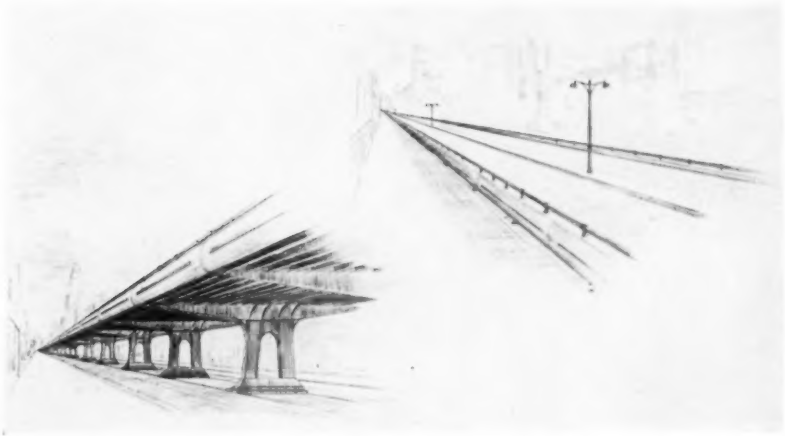
The second prize of $2,000 goes to Madigan-Hyland, consulting engineers, of New York—E. H. Praeger, Chief Engineer and C. F. Floyd, Architectural Designer. The design they submitted was that actually built for the portion of the new Henry Hudson Parkway between St. Clair Place and 135th Street, New York.

The third prize of $1,000 goes to Walter W. W. Jones, a civil service employee with the title of Engineering Illustrative Designer, Department of Borough Works, Office of the President, Borough of Manhattan. The Jury awarded Honorable Mention and $100 in cash to each of ten other designs. Most of the designs submitted in this competition were the result of collaborative work on the part of architects and engineers.

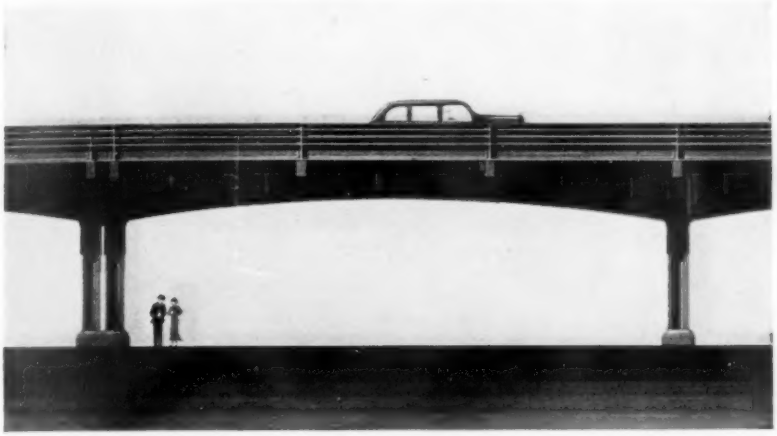
Traffic accidents and congestion constitute one of the most serious problems confronting America today. An annual toll of 40,000 fatalities, 125,000 permanent disabilities and 1,500,000 personal injuries creates a social situation demanding solution. Rapidly growing congestion, especially in cities, is an obstacle to efficient production and distribution, in general, and greatly depreciates the tremendous investment in automotive equipment of all



HOW LEWIS E. MOORE, OF BOSTON, VISUALIZED AN ELEVATED HIGHWAY IN A SUBURBAN AREA



THE DESIGN (AT RIGHT) THAT WON FIRST PRIZE, $5,000, IS BY HAZELET & ERDAL, CONSTRUCTING ENGINEERS, OF CHICAGO, ILL.



THE SECOND PRIZE, $2,000, WAS WON BY MADIGAN-HYLAND, CONSULTING ENGINEERS, OF NEW YORK CITY, FOR THE DESIGN AT LEFT

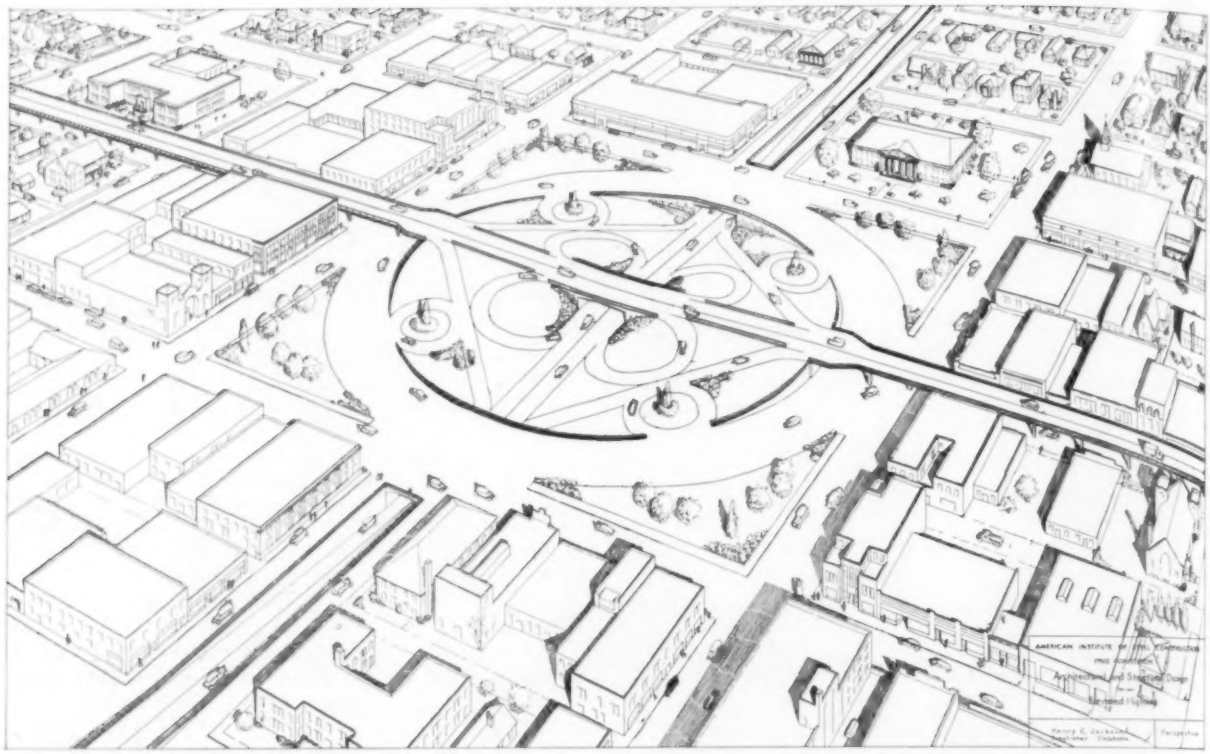
THIS DESIGN, BY WALTER W. W. JONES, ENGINEERING ILLUSTRATIVE DESIGNER, DEPARTMENT OF BOROUGH WORKS, OFFICE OF THE PRESIDENT, BOROUGH OF MANHATTAN, WON THIRD PRIZE—$1,000

kinds. Leading traffic authorities have been forced to the conclusion that the only permanent solution of this joint problem of accidents and congestion is through the construction of major traffic routes particularly adapted to the operating characteristics and potentials of the automobile. Thus, they have projected a type of highway design to have the following physical and operating features:

1. It provides for a complete physical separation of streams of traffic moving in opposite directions.
2. It eliminates any direct access to abutting property.
3. It provides for an elimination of all intersections through a complete and continuous separation of grades.
4. It provides decelerating lanes for vehicles slowing to leave the highway at specially provided exits, and accelerating lanes for vehicles entering from specially provided entries.

Traffic routes of this type of construction have already demonstrated their ability to carry safely large volumes of traffic through congested districts at open highway speeds. Several cities are now projecting comprehensive systems of this type and many others will undoubtedly follow.

An analysis of physical and fiscal elements leads to the conclusion that the essential functions of this special high-



A CLOVERLEAF TOWN CENTER VISUALIZED BY HENRY C. JACKSON, OF KINGFISHER, OKLA.

way design can be achieved most practically and economically through elevated construction. To stimulate interest in the program, which holds such great promise for the permanent solution of urban traffic problems, the American Institute of Steel Construction sponsored the competition for the design of a structure of this type.

Tornado Relief, Radio-Controlled

By BURT POWELL

REHABILITATION of small cities in the path of the "worst tornado in Midwest history" is going forward rapidly, aided in many ways by "big brother" cities in the central and western Illinois areas.

The tornado, or better, combined tornadoes, which had source in southeastern Kansas, cut in a northeasterly direction through five states before finally taking to the upper air in north central Illinois. The death toll neared 40. Hundreds were injured.

In Illinois, the railroad city of South Pekin, population 2,500, 12 miles southeast of Peoria, was worst hit. In this area, 13 lives were lost, and 60 injured. The tornado struck at 5 P.M. on March 30. It was all over in three minutes. Only three homes out of approximately 300 escaped serious damage. Leveled were the modern school, where 350 pupils had just been dismissed; the church, the large Chicago & Northwestern shops, the roundhouse and a new municipal water tower which a commissioner said had "just been paid for, two weeks before." The loss will total several million dollars.

Of interest to THE AMERICAN CITY readers are the relief methods and complete liaison among state, county and neighboring municipalities in the same and other counties. Within an hour after the city was swept away, the Red Cross banner was flying from a shattered window in the wrecked community house. Downstairs rooms, still intact with the exception of windows and doors, were wallboarded. Lamps and candles served as lights.

Nurses hurried to the scene as WMBD, Peoria's 5,000-watt transmitter, flashed out word of the disaster. Relief was really radio-controlled, and served even more effectively than at Louisville, Ky., during the flood, for here supplies and man-power could be speeded directly to the scene. The station "tied in" not only with its own short-wave field transmitter which was set up in the community house, but with three state police short wave stations as well, together with a direct wire to supply headquarters at Pekin, four miles north of the stricken village.

Listeners throughout central Illinois heard the entire story of the tornado horror unfold through the cross-fire of emergency requests carried by the radio station. Within two hours after the tornado struck, all injured had been hospitalized, and the dead removed from the wreckage. All roads and fields surrounding South Pekin as well as the

THE SOUTH PEKIN TORNADO— DESTRUCTION AND REHABILITATION

streets were adequately patrolled by state police, sheriff's officers and National Guardsmen. No looting and no sightseeing traffic was the result.

In the meantime, offers of cots, blankets, food, ambulances, were flooding the radio station at Peoria. Immediately accepting its responsibility as a clearing-house, WMBD checked all requests with needs at the scene, acceptances coming back via the short wave transmitter. Provisioners, department store executives and relief agencies kept tuned in, verifying requests by telephone.

Work of clearing débris and removing hazards began immediately, the pitch-darkness relieved by portable lighting sets taken to the village. Corpsmen from a nearby CCC camp worked faithfully. The township garage located at the edge of the village was blown away, but a Caterpillar track-type tractor left to the mercy of the winds was undamaged. Its yellow paint pock-marked from the whipping sand, the tractor was soon at work hauling huge elms off the streets, clearing damaged roofs and walls. Emergency work completed in the village, the tractor followed the wake of the tornado, clearing trees from the township roads.

As this is written, it has been decided by Chicago & Northwestern railroad officials to rebuild the present roundhouse and shops and property, rather than to move or abandon them. The news has brought great cheer to South Pekin, since almost the entire town depends upon the railroad for support.

So there is no complaint in the village; its residents are in accord that "we're lucky to be alive." The sound of hammers rings throughout South Pekin. A sizable relief fund is being collected to care for the refugees' immediate needs, and optimism reigns.

City Health Conservation Contest

THE Chamber of Commerce of the United States in cooperation with the American Public Health Association has announced awards for the 1937 City Health Conservation Contest.

Boston, Mass., wins the first award in *Group I* (cities of over 500,000 population). Additional awards in this group go to Cleveland, Ohio, and Pittsburgh, Pa. In *Group II* (cities of 250,000 to 500,000 population) *Louisville, Ky.*, and *Providence, R. I.*, receive first awards, and an additional award goes to Dallas, Texas. In *Group III* (cities of 100,000 to 250,000) the winner is *Hartford, Conn.* Awards also go to Grand Rapids, Mich., Yonkers, N. Y., Reading, Pa., Erie, Pa., Honolulu, Hawaii, Lynn, Mass., Tacoma, Wash., and Knoxville, Tenn. In *Group IV* (cities of 50,000 to 100,000 population) *Sacramento, Calif.*, gets the first award, and other awards go to Evanston, Ill., Newton, Mass., Greensboro, N. C., and Saginaw, Mich. In *Group V* (cities of from 20,000 to 50,000 population) *Greenwich, Conn.*, is the winner, and Plainfield, N. J., Auburn, N. Y., Winona, Minn., Elmira, N. Y., Watertown, N. Y., Pittsfield, Mass., Maplewood, N. J., and Orange, N. J., are given awards of merit. In *Group VI* (cities of less than 20,000 population) *Englewood, N. J.*, is the winner, and awards go to Hibbing, Minn., Virginia, Minn., and Middletown, N. Y.

The 1937 Contest had 263 entries. The Committee made it clear that these are not prizes for the healthiest cities; they are prizes for the most effective efforts to meet local health problems.

Bituminous Paving and Resurfacing in St. Louis

Data from Annual Report of Department of Streets and Sewers

THE Bituminous Section of the Department of Streets and Sewers, St. Louis, Mo., has charge of all hot-mix street resurfacing. Various asphaltic mixtures are prepared at the city asphalt plant, which, while antiquated, has been overhauled each year during the winter months and with minor repairs each week-end has been handling a daily output of 200 tons, 5 days per week. The accompanying chart gives a yearly comparison of the plant output, expenditures and number of men employed. The increase in tonnage is attributed to better weather conditions and the installation of a new rotary drive. The difference between expenditures and the number of employees for the period from 1933 to 1937 as compared with previous years, is quite favorable.

Approximately 1,800,000 square yards of resurfacing have been installed in the past four years. With the exception of some 400,000 square yards installed during CWA, all work was performed with city forces at no expense to the abutting property owners. Many old streets paved with brick or granite block have been covered with this plant-mix, resulting in the elimination of costly maintenance. Resurfacing put in place four years ago shows practically no deterioration, and indicates a life of at least ten years. The following average costs cover labor and material, but exclude overhead and contractors' profit.

Mat coating over badly cracked sheet asphalt, 10c per square yard.
Anti-skid, non-glare resurfacing over cracked sheet asphalt, 25c per square yard
Anti-skid, non-glare resurfacing over brick or granite block, 50c per square yard.
Anti-skid, non-glare resurfacing substituted for wood blocks, $1 per square yard.

The accompanying illustrations show the various steps used in resurfacing Hadley Street. The first two photographs show the men at work tearing up the wood blocks and removing the sand cushion. The next shows the rails being cut with a torch through the center of the web. The rails were not removed from the streets, for the flange was imbedded in a concrete base. The last two photographs show the placing of the binder course and the rolling of the top wearing surface. There are many other instances where the entire rails have been resurfaced. In this particular case the rails were burned off for their salvage value, and it was considered necessary to obviate a high crown in the street.

RESURFACING OPERATIONS IN ST. LOUIS, MO.

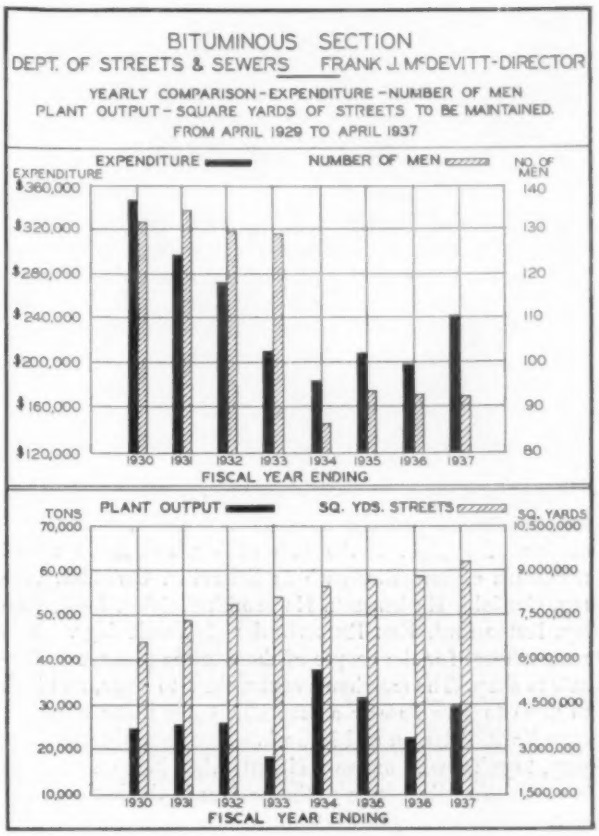
1 and 2. Removing wood blocks and sand cushion on Hadley Street. 3. The street-railway rails being cut through the web with a torch. The rails were not removed, since the flanges were imbedded in the concrete base. 4 and 5. Placing the binder course and rolling the top wearing surface. In many cases the rails were left in place and the resurfacing carried over them where the crown had been low

Letters from bus drivers, taxicab and service car operators testify to the anti-skid, non-glare characteristics of the resurfacing which has been used. Practically all hazardous sheet asphalt intersections have been treated with this material, and during the past year traffic accidents at these intersections have been reduced 50 per cent. The modern automobile possesses high speed and has quick-starting characteristics. Because of these factors, all sheet asphalt intersections should be treated to provide increased friction. Better still, the entire street should be so treated. A number of the principal sheet asphalt thoroughfares in St. Louis have been resurfaced during 1937, and this program is to be continued in the interest of public safety.

Night resurfacing was inaugurated largely to avoid interference with traffic on congested streets. Care is exercised in raking and rolling in order to secure a smooth surface. A lot depends on effective lighting. This can best be secured by using a sufficient number of portable stands on each side of the street, with a battery and two automobile headlights placed on each stand. Spare batteries are desirable for charging during the daytime. On streets where street-car tracks are located, batteries of electric lights taking the current from the trolley wires are used. Much better speed and lower costs can be obtained on night work because of the freedom from traffic congestion. Night work is also advisable in business districts to prevent interference with merchants in the conduct of their shops.

Bridge Paving

The approaches to the municipal bridge across the Mississippi River, which were paved with sheet asphalt, were in deplorable condition. Ordinarily, it would be necessary to shut off traffic and reconstruct the approaches by contract. Such procedure would have been unfortunate, since bridge tolls, used exclusively for relief purposes, would have been eliminated for a period of 90 days. The elimination of tolls and a reconstruction job at $5 per square yard would have meant an outlay of approximately $310,000 by the city. Owing to using resurfacing methods devised by the Department of Streets and Sewers and performing the work at night, when there was the least interference to bridge traffic, the paving cost, including new expansion joints, was about $30,000. This represents a saving of $280,000 to the taxpayers. The old paving, consisting of sheet asphalt, was always hazardous in wet weather, and many favorable comments have been made by motorists on the new anti-skid resurfacing.



Town Planning Yardstick

An Editorial from the Newark Evening News, March 31, 1938

MUCH of the fogginess about community zoning and planning in respect to the constitutional and legal factors is dissipated by Justice Heher's opinion remanding an application for the residential development of a 4½-acre tract in West Orange for redetermination by the Town Planning Board.

Upon the source of authority to legislate in providing "a comprehensive scheme for physical development" of community efficiency and progress, no broader statement could be made than this:

The state possesses the inherent authority—it antedates the Constitution—to resort, in the building and expansion of its community life, to such measures as may be necessary to secure the essential common material and moral needs. The public welfare is of prime importance, and the correlative restrictions upon individual rights—either of person or property—are incidents of the social order considered a negligible loss compared with the resultant advantages to the community as a whole.

This leaves no question that in the opinion of Court the planning act of 1930 is fundamentally sound. At the same time the Court emphasized that where the power is exercised it must be demonstrable that it was "necessary for the general good and welfare" in conformity with statutory considerations delegating the power in municipal direction.

The application for the present development had been denied by the Planning Board without stated reason. In opposing the certiorari proceedings, however, the town maintained that the development would not be in character with the neighborhood, that it would decrease ratables, add to traffic hazards and increase police and fire costs.

Rejecting these as having no substantial factual basis, the Court expressed the conviction that "the views and desires of the neighboring estate owners" had been determinative. It characterized this as a "palpable misconception of the law," and laid down as the controlling standard "the effect upon the entire community as a social, economic and political unit," and not the advantage or detriment to neighboring land owners.

Justice Heher makes crystal clear the real purpose and scope of town planning, and the only method that may be followed legally and ethically in providing for community growth and needs.

Passaic Likes Parking Meters

By BENJAMIN F. TURNER
Mayor, Passaic, N. J.

THE city of Passaic, N. J., the first city in the East to experiment with this modern method of parking control, installed 140 parking meters in January, 1937, and 386 more of the same make the following September. The first installation was made with the consent of the merchants in the metered district. The second installation was made on petition of other merchants who had observed the larger turnover of cars, the disappearance of the critical parking problem, and the general satisfaction shown.

Every city has its traffic problem with the common denominator of parking congestion. Passaic, with a population of 63,000, is the hub of a wheel made up of numerous communities such as Belleville, Carlstadt, Clifton, Garfield, Hackensack, Hasbrouck Heights, Lodi, Nutley, Rutherford, East Rutherford and Woodbridge. It is most natural for the people of these towns to come to Passaic to shop. The merchants expect them to come, and look to them to give Passaic a favorable trade balance against New York, Paterson and Newark. These out-of-town shoppers, together with our own citizens when bent on purchasing, constitute the cream of the parkers in the business district. They found the competition for space increasingly keen. Probably their worst competitors were the merchants and clerks who parked all day in front of their own or other places of business.

Another element of our local traffic problem is the fact that the main line of the Erie Railroad runs at grade throughout Main Avenue, the principal artery of the business district. This means a periodic extra piling-up of traffic at all cross streets, and hand operation of the traffic signals on Main Avenue. When to this unavoidable jamming and hazard was added the congestion of parked cars throughout the four square blocks of the central business district, a situation was created which, getting worse, eventually had to be dealt with. Public opinion, including that of the merchants, at last caught up with the facts, and a deputation called on our Commissioner of Public Safety, John J. Roegner, and demanded that one-hour parking be enforced.

The Commissioner inquired whether they knew what that entailed. Parking was of all shapes and volumes—side, angle, nose, double, sometimes triple, and all-day. Our own townspeople, whom we all knew, were regular offenders. Endless, unpleasant and unprofitable arguments were foreseen, as well as an unpopular police force. Ten additional officers would be required to do the job, and this alone would add $25,000 to our already badly bent budget. But besides the discomfort and probable loss of business, accidents were of increasing frequency, with 210 motorists and 264 pedestrians injured and 17 fatalities in 1936.

We were at the point which The Municipal Index makes at the close of its general survey of Parking Meters in 50 Cities, where it asks these questions:

Will you prohibit parking?

MAYOR TURNER OF PASSAIC AT A PARKING METER

Will you try to compel the police to enforce drastic regulations quickly?

Will you install parking meters?

We did not want to prohibit parking and thus discourage trade—our efforts are in exactly the opposite direction. We could not afford the cost of more police officers nor the headaches certain to accompany strict enforcement of one-hour parking. We turned to parking meters.

Before reaching any decision, we discussed the proposition of metering with the merchants and business men situated on the blocks on which a trial would be made. We recognized that a fair trial required having their permission and as far as possible their cooperation.

The Meter

The parking meter is a comparatively new device. Something in the nature of a clock, it must stand out in all kinds of weather, take the abuse of any slot machine—and sometimes more. It was plain to our Commission that the strength of the meter must be the determining factor in the selection. The job of selecting a meter was given to City Engineer John J. Schneider, who invited the manufacturers to send representatives with samples. Each man was given 15 minutes for a sales talk, and requested to leave his meter for 48 hours. A schedule of desirable features had been drawn up, and the meters were examined, tested, and rated. The Marktime meter manufactured by M. H. Rhodes, Inc., Hartford, Conn., was selected. We installed 140 of them on test, and nine months later 386 more. The Parking Meter Co. of New Jersey, local distributor of the Mark-Time meter, made both installations.

Supervision of the Meters

Supervision is necessary, and the parking regulations are enforced—though not harshly. A car may stop at the curb while the driver buys a newspaper or a pack of cigarettes, without his having to fee the meter. Grace of 5 to 10 minutes also is permitted. It is important to understand that all we were trying to do was to cure the congestion. We installed meters to straighten out our traffic problem, which they did. As Traffic Lieutenant Thomas Crawbuck says: "When I was appointed to this job two years ago, my worry was just where the parking meters now are." He is delighted with the results. In fact, everyone in Passaic seems to like parking meters.

Officer John Vida starts out on his three-wheel Harley-Davidson motorcycle at 7:50 A.M. to make sure that all the meter dials show white. In 15 minutes he is again at the start of the metered zone, ready for the 8 A.M. to 6 P.M. meter day.

Repair work and servicing have been negligible. If any officer finds a meter out of order, he reports it to Officer Vida, who adjusts it at once or, in the case of about two meters per week, removes the "unit," and when four of these have accumulated, mails them to Hartford in a special case provided by the manufacturer and requiring 18 cents postage. As City Engineer Schneider says on this subject: "It is hard to talk about a machine you don't have trouble with. It just works. I did not have one comeback on my judgment."

The coin boxes are collected in three half-days each week, by a police officer and a representative of the City Treasurer's office.

Merchants Petition for More Meters

Remarking the excellent parking conditions in the metered district and the satisfaction of the merchants there, business men on unmetered blocks demanded that meters be installed. We said we would do this on petition only. Petitions were therefore signed, resulting in full metering of the central business district on both sides of the railroad tracks on Main Avenue.

The revenue has been as follows:

January 5, 1937 to August 31, 1937 (140 meters):	
Jan. 5—April 30	$2,322.60
May 1—May 31	581.55
June 1—June 30	505.10
July 1—July 31	530.45
Aug. 1—Aug. 31	456.40
	$4,396.10
September 1 to March 31 (526 meters):	
Sept. 1—Sept. 30	$1,643.40
Oct. 1—Oct. 31	1,634.45
Nov. 1—Nov. 30	1,475.35
Dec. 1—Dec. 31	1,927.45
Jan. 1—Jan. 31, '38	1,053.30
Feb. 1—Feb. 28	1,157.95
Mar. 1—Mar. 31	1,326.10
	$10,218.00
Total receipts January 5, 1937 to March 31, 1938	$14,614.10

Traffic Improvements Ahead

It is expected that in the course of time, when the meters are all paid for, a fund will accumulate to the credit of the Department of Public Safety. Then it may be possible to provide improvements which we have long wanted to establish. For example, some time ago we had a comprehensive traffic survey made, which recommends a new traffic-signal system. We are thus combining a present successful method of regulating parking with an expectation of developing our entire traffic system with funds earned by the parking meters.

To put the meter in operation, proceed as follows: Drop a nickel in a slot, turn the handle which operates the pointer, until the pointer goes to 60. As soon as the user starts to turn the arm, a signal labeled "Officers' Warning" comes up on the dial. This stays up until the user has turned the arm to "60" and insures his getting his full time. If the coin slot is plugged or for any reason the meter refuses to work, the signal stays up, and the nickel stays in the coin chute, definitely eliminating any possi-

TRAFFIC LIEUTENANT THOMAS CRAWBUCK AT ONE OF PASSAIC'S PRIVATELY OWNED PARKING LOTS, WHERE BUSINESS HAS GREATLY INCREASED SINCE THE PARKING METERS WERE INSTALLED

This is the Harley-Davidson motorcycle which is used to patrol the entire metered zone

bility of the user's being tagged with a summons for having evaded depositing his nickel. It further calls the officer's attention to the fact that someone has attempted to use the meter and either did not know how or failed to take all of his time. The officer at once corrects this.

We liked particularly the coin feature, by which the coin is visible and, when it does drop into the box, falls into a sealed receptacle which locks automatically. As a matter of fact, the coin does not drop until the 60-minute parking period has elapsed, when it drops into a window, replacing the previous user's coin, and remains in the window until the next user drops it into the Gray Pay Telephone Co. coin box, which locks on being removed from the meter case, and must be set to open on being returned to the case. This is protection for the parker, the collector, the taxpayer and the city administration.

Early in January, 1937, the 140 meters were installed. The all-day parkers disappeared immediately, as merchants and clerks made room for shoppers. Double parking was cut down by 95 per cent. The 60-minute period was reasonably observed. The meter became a mechanical policeman. It commanded respect. Furthermore, it stopped most arguments between traffic officers and motorists, because the meter told the story, proved at once whether the motorist or the officer was right.

Sixty minutes is found to be ample for most shopping purposes. As a matter of fact, only one in three or four space-users pays for the privilege; it is common to find four and five cars using space on the same nickel, and the observed record was 11 cars parked legally on one nickel.

The Cost Per Man of Work Relief

THE Bureau of Labor Statistics of the Department of Labor today reported to the Public Works Administration that to provide one man with a month's regular employment through the PWA program cost the Federal Government only $61.24.

The measurement was made by the Bureau on the non-Federal PWA program. It included careful analysis of upwards of a thousand completed PWA non-Federal projects of many types. The figures were based on actual 1937 construction cost experience on the program.

Dispelling the uncertainty as to employment costs on the PWA program, the Bureau said that the man-month cost of $61.24 to the Federal Government covered both the direct labor at construction sites and the indirect labor created in regular industrial employment because of PWA material orders. Thus, for the Federal expenditure of $61.24 one man found a month's employment either at the site of PWA construction or in a factory, mine or forest, or in transportation or distribution of materials.

All the employment created was regular employment under normal conditions. On the actual construction sites, workmen were paid prevailing wages by contractors, and normal working conditions were maintained. The indirect labor created in industrial work was normal, private employment at regular industrial jobs.

The $61.24 figure includes the total Federal expense for creating one month of employment. It is based on the 45 per cent contribution by PWA toward the cost of non-Federal projects. The balance of the cost, 55 per cent, or $74.84, is paid for by the communities which choose to erect the projects. Thus the total cost of creating the employment is $136.08, and is shared by the localities and the Federal Government.

The Bureau of Labor Statistics worked out the man-month cost figure as part of its analysis of the employment effects of the PWA program. In this study, which surveyed the program from July, 1933, through June, 1937, it found that on non-Federal PWA projects, more than 2½ times as much work was created "behind the lines" in industry, in mines and in forests producing construction materials and transporting them, as was created in direct employment at the site of construction of a project.

Stated another way, the expenditure of $61.24 by the Federal Government means that a man who otherwise might be unemployed finds useful work for one month; business and industry receive orders; private concerns are able to find employment for workers, forests, transportation and factories are kept busy, and a useful public project is created.

In its study of the PWA program, the Bureau of Labor Statistics found that between July, 1933, and June, 1937, a total of 556,206,937 man-hours of direct site employment had been created on non-Federal PWA projects. Two-and-a-half times as much employment, or 1,390,517,343 man-hours, were created behind the lines to supply the projects with materials. Thus, on this part of the PWA program, a total of 1,946,724,280 man-hours of employment was created. Enormous amounts of materials were purchased, in some instances PWA orders representing substantial percentages of total national production of certain types of building materials during the period.

Household Furnishings Gradually Going Off Tax Lists

HOUSEHOLD furnishings and personal effects are on their way off the tax lists, a survey by the National Association of Assessing Officers indicates. States with exemption laws now total 38, Georgia having been recently added to the list.

Proponents of tax exemption of household furnishings advance these arguments: The assessor finds it difficult to locate all property of this sort unless the home is practically "invaded." Valuation of much of this property is difficult because of absence of standardization. Taxes are often allowed to go delinquent and in many states cannot be collected because such property is exempt from attachment. Revenue derived is too small to warrant the expense of assessment and collection. Household furnishings of a great many persons are little more than adequate for decent living and should therefore be exempt, at least so long as they do not exceed a certain value.

States have made five general types of exemptions:

1. *Full exemption*, in Delaware, New Hampshire, New York, Ohio, Oregon, Pennsylvania, Washington and Wisconsin.
2. *Limited exemptions*, applying in 22 states and the District of Columbia, and varying in amount from $50 in South Dakota to $1,000 in Louisiana and the District of Columbia.
3. *Lump-sum personal property exemptions* under which all taxpayers or heads of families or householders are exempt on personal property of all types up to a certain amount. Seven states have exemptions of this type, ranging in amount from $100 in California and Minnesota to $1,000 in Tennessee.
4. *Lump-sum exemptions applicable to both personal and real property.*—New Mexico is the only state offering this exemption to the general public.
5. *Vanishing exemptions*, available only to taxpayers whose total holdings in household furnishings do not exceed a certain amount. Idaho is the only state offering this exemption to the public, but restricts it to citizens.

Small Activated Sludge Plant with Mechanical Aeration

Waterloo, Ill., Still Only One-Third Connected to Sewers

TO its municipally owned electric light and water plants with diesel power, the city of Waterloo, Ill., added a new sewer system in 1936, and in November of that year placed a new activated sludge-treatment plant in operation. Unfortunately, only about one-third of the 2,300 population is as yet connected to the sewers, but it is expected that the 125 services will soon be increased considerably, because the addition of more domestic sewage will still further improve the operating conditions of the plant. At present the larger part of the sewage comes from a milk-condensing plant.

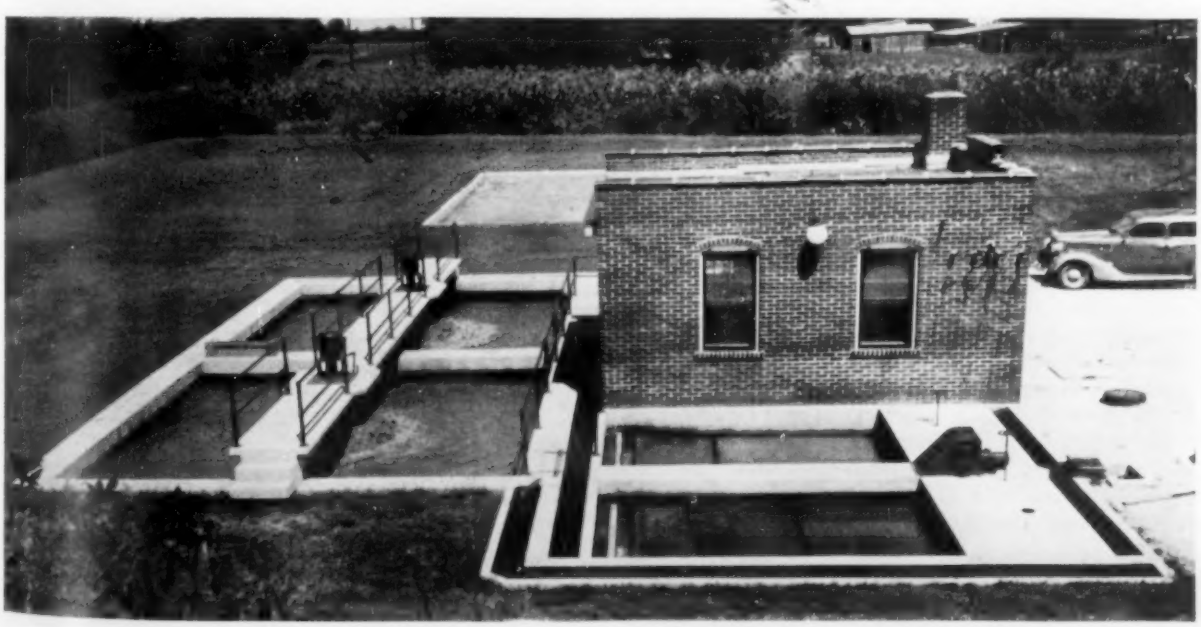
The new sewer has a minimum 8-inch vitrified tile pipe, the one exception being a 6-inch pipe service to a single house where other connections cannot be made. The east end of town, being lower than the main outfall, has a sewage pumping station with automatic float control of the single Chicago sewage ejector.

The Sewage-Treatment Plant

The main sewer is a 15-inch line delivering the sewage to a single 10-inch Chicago comminutor at one side of the entrance chamber. On the other side is a small bar screen for removing rags and other material temporarily in case the comminutor is out of service. The average flow of sewage to the plant is 125,000 gallons daily at present. Storms do not increase the flow, since there are no storm-water drains or house drains connected to the new sewer lines. This is one of the blessings of a new sewer system, for there has been no chance for plumbers or others to make illicit connections to the sewers.

The sewage with the comminuted solids flows to a pair of primary settling tanks measuring 9 feet 6 inches by 20 feet, and equipped with Rex sludge collectors and scum-removal apparatus. The bottom of the settling basin slopes to a hopper at the influent end for the accumulation of sludge, and at the effluent end a scum trough is provided. The scum as it gathers is pulled by hand into the scum trough and flushed down into the sludge pit, from which it is pumped with the raw sludge to the digester. There is a by-pass at the primary settling tanks, so that either of the tanks can be taken out of commission for cleaning and the sewage run through the other; or the primary tanks can be by-passed completely and the sewage run direct to the aeration tanks; or the entire plant can be by-passed.

In the trough between the primary settling tanks and the aerators the return sludge is admitted to the flow, while the wasted sludge is delivered to the influent channel of the primary tanks. The aeration tanks, in duplicate, are 13 feet 6 inches deep and 24 feet in diameter. Each is equipped with a Chicago mechanical aerator driven by a 3-hp Wagner motor, the current for which is furnished by the municipal electric plant. Either of the aerators can be cut out of service and the tank by-passed. In operation thus far, with the low flow of sewage, it has been found that the operation of both aerators at minimum speed is very effec-



GENERAL VIEW OF THE WATERLOO SEWAGE WORKS FROM THE DIGESTER

All of the plant, except the final settling tanks, which are beyond the pump-house, may be seen in this photograph

tive in producing an excellent activated sludge.

A Dorr clarifier 24 feet square with a 22-foot diameter bottom to which the sides slope is used as a secondary settling tank, and the sewage is 9 feet 3¾ inches deep in the tank. The effluent flows over a rectangular weir and thence to a notch weir, where it is chlorinated and also measured by a float, which records the flow on a Builders Iron Foundry recorder in the plant.

A compact brick structure serves to house the pumps and laboratory. In the basement of this 18 x 21-foot house is a Bryant gas heater used to burn digester gas for heating the water in the coils of the sludge digester. A small Economy circulating pump moves the water constantly through the coils to insure a positive flow. Digester gas is metered with a Metric Metal Works gas meter, next to which is a flame trap and gas washer.

The pumping equipment consists of duplicate 60-gpm Chicago centrifugal pumps belt-driven by Wagner 2-hp motors. These are used for pumping the activated sludge up to the division box on the ground floor, where the flow is controlled to return or waste. These two pumps are alternated in service every 24 hours. A Chicago 75-gpm Scru-Peller pump with a 3-hp Wagner motor is used about 30 minutes each day to pump raw sludge to the digester. A complete switch panel for the control of the pumps is located in the basement with the pumps, which are reached from the ground floor by an iron ladder.

On the ground floor, in addition to the division box for the sludge, is a small laboratory equipped for the routine tests. The city officials are increasing the laboratory equipment in accordance with the recommendations of the State Health Department, so that the two operators may have better knowledge of the condition of the sewage at every stage of the operations. A Wallace & Tiernan vacuum type solution feed chlorinator is installed on the ground floor to feed about 4 pounds of chlorine to the effluent per 24 hours.

Digester

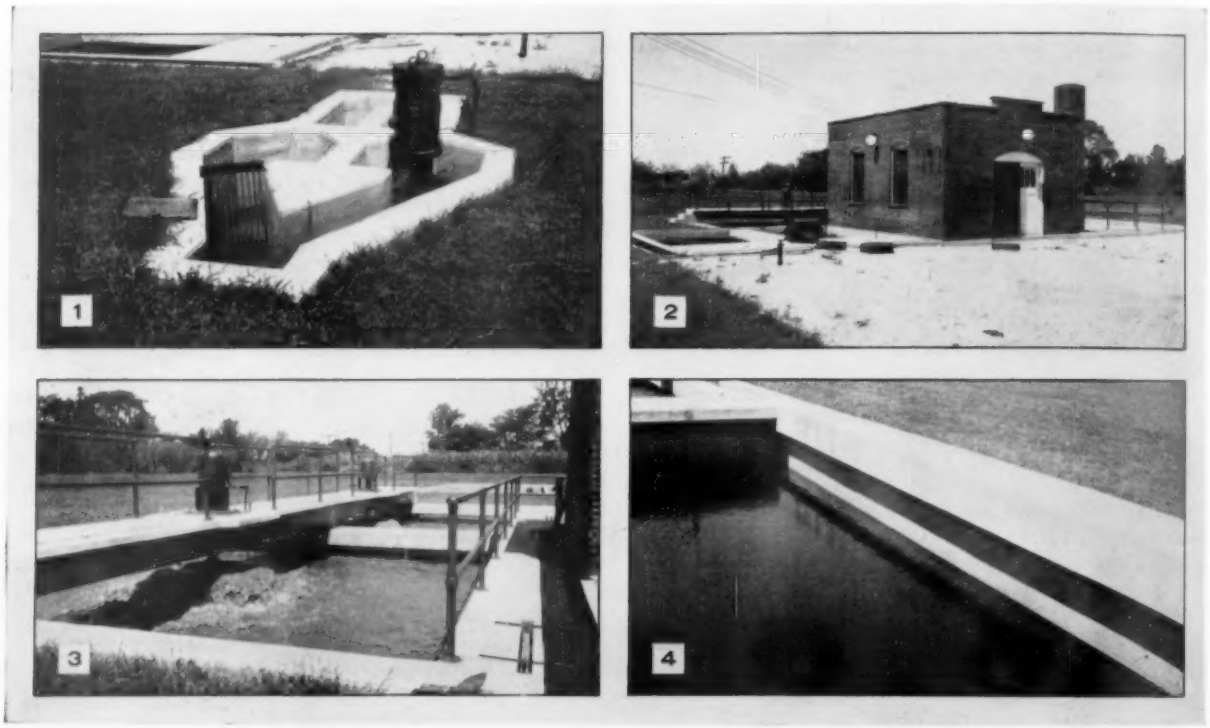
The sludge digester, located just south of the pump building, is 26 feet in diameter, 14 feet 9 inches deep at the sides, and 15 feet 3 inches at the center. It is equipped with a Dorr sludge-stirring mechanism and scum breaker driven by a 1-hp General Electric motor, and has a fixed cover. The overflow of supernatant liquor runs to the influent channel of the plant, and the pH of the liquor is usually about 7.0. A PFT waste gas burner is attached to the side of the pump-house.

A pair of sludge beds with sand beds and concrete curbs, measuring 51 feet by 41 feet 6 inches, is located in the middle of well-kept lawns on the north side of the pump-house.

The new activated sludge plant at Waterloo is operated under the direction of Oscar Rice, City Electrician, by two operators, A. J. Hellmer and Eugene Wolf. The operators alternate on the 12-hour shift during the day, and the plant is run without an attendant during the night. The consulting engineers for the plant were Sheppard, Morgan & Schwab, of Edwardsville, Ill.

The plant uses about $90 of electric power a month, based on the minimum commercial rates of the municipal power plant.

T. R. K.



DETAILS OF THE WATERLOO, ILL., ACTIVATED SLUDGE PLANT

1. The comminutor and bar screen at the by-pass. 2. The pump-house and laboratory with the primary settling tanks at the left. 3. The Chicago mechanical aerators. 4. One side of the effluent weir

FAULTY

Left—What looked to be foundation rock is seen to have a mud seam under it. The other two photographs were used to condemn a ceiling; the reflections in the middle photograph show that the ceiling is not flat; the stains at the right were caused by water which seeped through the floor into the ceiling

The Growing Applications of Municipal Photography

Every city should make its own photographs of records, crimes, bad accidents, construction projects and progressive activities. In one of your departments there is an experienced and enthusiastic amateur photographer—give him the job of working up this valuable municipal service.

MUNICIPAL records are famous for their number, volume, troublesomeness, exposure to loss, and necessity. They begin with births and they include deaths, and the early records are as likely to be as valuable as those of today. In many cities the vital statistics and the tax roll go back more than 100 years. Occasionally, in some place, they are all swept away by fire or tornado, with much resulting confusion. It is now possible, at moderate cost, to make a photographic copy of such records, on a roll of film of which 100 feet can be wound on a reel 4 inches in diameter, ¾-inch thick, containing up to 4,000 separate photographs of pages and documents.

Last summer the Cincinnati water works had all its drawings—many of them quite large and not in good condition—put on a special fine-grain 35-millimeter film.

When a criminal record is wanted, the same process produces it. The New York City Police Department is now engaged in preparing minute, compact, accessible photographic records covering the 1,000,000 cases in its files. Each record consists of three consecutive little photos giving the fingerprints, the photographs, and the history of each criminal. As these records are made, the original documents are returned to their respective files. The new photographic record of them will be stored in an entirely different location as protection to these, in many instances, irreplaceable criminal records.

VOICE OF SAFETY, ROCHESTER, N. Y.

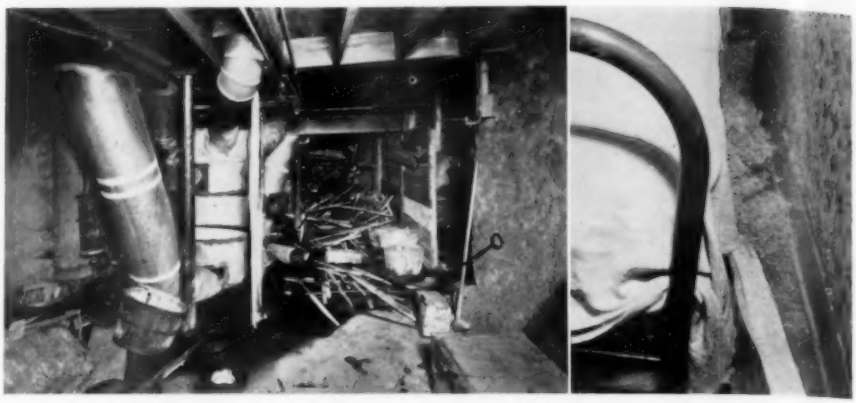
Everyone is familiar with tax maps, and the more recent use of photographic bird's-eye maps. Increasing interest is being shown in the use of photographs of the individual buildings. Among the large cities following this practice are Seattle, Toledo, Richmond, Grand Rapids, Bangor, Tampa, Providence, and Camden, N. J., and Amsterdam and Mamaroneck, N. Y. The most recent is New York City, whose new individual taxpayers' assessment card carrying a 2½ x 3-inch photograph is reproduced here. A force of 400 WPA workers and 32 photographers are collecting the data on 825,000 parcels (817,000 in 1937) and taking the pictures of the 665,000 buildings of Greater New York.

THE PLAINFIELD, N. J., POLICE DEPARTMENT MAKES PHOTOGRAPHS FOR EVIDENCE

A year hence, when this project has been completed and the new system is in regular operation, it will be up to the Tax Department to maintain these data. At least 5,000 new photographs per year will be needed, and a photograph division of the Research Bureau will take them.

An interesting possibility is that the photographic element of the Tax Department may come to be regarded and used as the central photographic office of New York's municipal government. Certainly its photographs of all buildings will be of considerable use to a number of other departments such as the Housing and Buildings and the Law departments. Indeed, the Research Bureau is fast becoming the central information bureau for all types of property, and, as one assessor said: "The photograph tells me more about a building than most of the words." Incidentally, these photographs, preserved, will furnish a most interesting historic record of every building site in the five boroughs.

The acceptance of photographs as court evidence is well known and all but conclusive. In view of their historic



ARSON

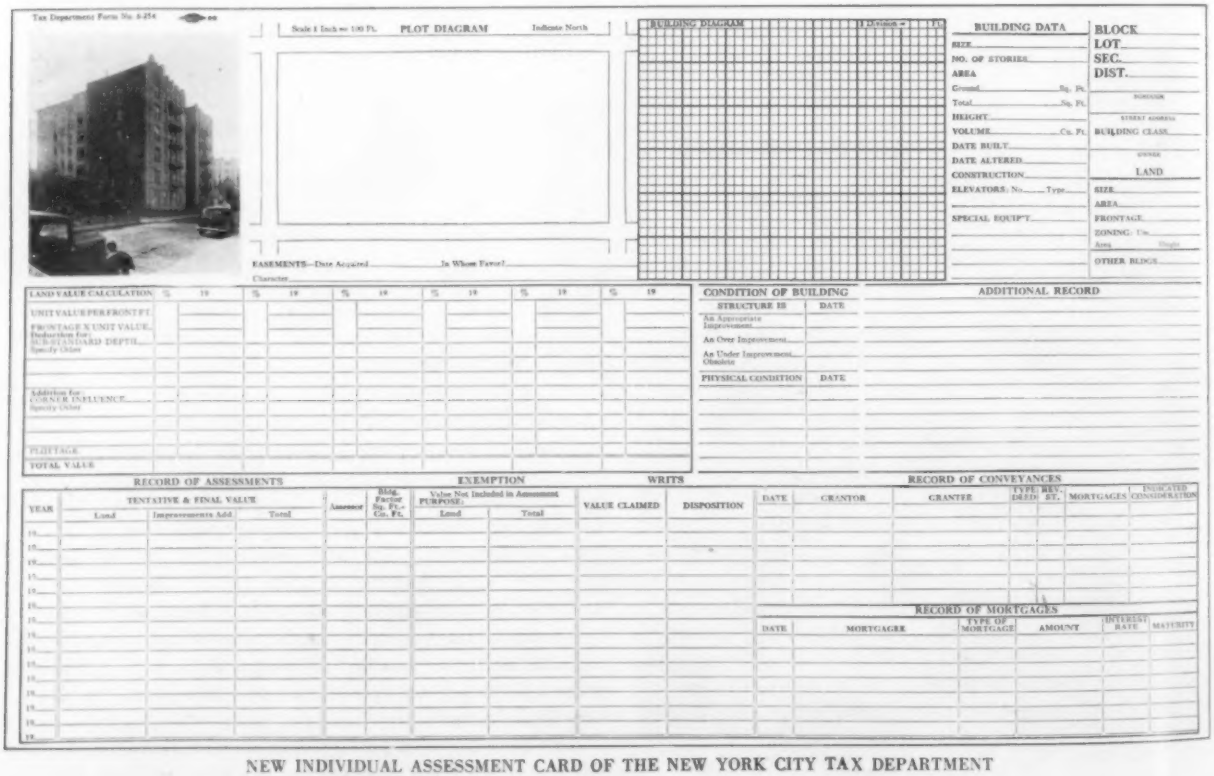
The trash is the start of a streamer which burned out; it extended up into the bedroom as shown at right

value in the detection and prosecution of crime, it is remarkable that there are many police departments which do not own a camera. Police officers who use cameras point out that police photographs constitute confidential information which should be produced by, as well as for, the authorities. The standard routine jobs are mugging, copying documents and enlarging or reducing, taking pictures at the scene of a crime or accident, including close-up work such as fingerprints.

Increasing use of the camera is being made to record the scenes of traffic accidents while fresh. Bad smash-ups are photographed as part of the investigation. These photographs will show not only the scene and the relative position of the cars, but skid marks, smashed headlights and dented fenders. The accident-prevention car of Newark, N. J., carries a Speed Graphic camera equipped with photoflash synchronizer and built-in beam focuser for night pictures.

Almost any group of a dozen men will contain a camera enthusiast. He is the man to delegate as the photographer for a small police department. If he and the chief are sufficiently interested, refinements will gradually appear in the shape of numerous lenses and filters and photographs taken in infra-red, ultra-violet and polarized light and through the microscope. For just the necessary routine work, however, there are all-purpose outfits which are all but foolproof. As these photographs are actually confidential information, they should be developed in a darkroom in the departments.

Exactly the same reasoning and recommendation goes for the fire department. Here, official photographs are not only of great value in arson cases, but also in the study and teaching of fire prevention. Find your fireman who likes to take photographs—tell him what kind of photographs you want and their purpose. If he is a good amateur photographer, he will produce, and the entire municipal government will be glad you have him and will borrow him.



NEW INDIVIDUAL ASSESSMENT CARD OF THE NEW YORK CITY TAX DEPARTMENT

Must a City Pay Federal Sales Taxes?

By LAWRENCE R. BLOOMENTHAL
Attorney; Tax Consultant, Allen and Company, Chicago-Des Moines

EVERY modern city spends a substantial part of its income in purchasing sporting goods for schools and playgrounds, motorcycles, automobiles, firearms and ammunition for the police department, and fire engines and equipment for the fire department. Among other necessary expenditures are tires, tubes, gasoline and lubricating oil, radios, soap and cameras. In selling these articles to the city, local merchants seldom realize that they are passing on a Federal sales tax which has been charged to them by the manufacturer. Yet, by complying with certain requirements, they can reduce their price in the amount of this tax without suffering any loss themselves. (See Note, p. 61.)

Unlike the state sales taxes which are levied on retail sales, the Federal excise taxes are imposed on sales by the manufacturer to a wholesaler, jobber or other customer. Whenever the sale is made directly to the United States, a state or city government, no tax need be paid. Such direct sales are not a common practice, however, because most governmental bodies believe it a better policy to order supplies and equipment through local merchants and thus assist the taxpayers of their own community.

If all sales were direct "manufacturer to city" transactions, the problem of obtaining the exemption allowed by law would be simple. The manufacturers would see to it that the responsible city officials executed the proper exemption certificates and affidavits and that these were filed with the Treasury Department. The sale could then be made tax-free.

When local dealers enter the picture, however, a more complicated situation arises. At the time a radio or automobile was ordered from the manufacturer, they probably did not know that this merchandise would later be resold to a purchaser entitled to exemption. Therefore, this Federal tax is included by the manufacturer as a part of the wholesale price and is paid by the dealer, who expects to be reimbursed by passing it on to his customer.

In the smaller communities, the sales of automobiles or other taxable articles to the city, county or state is necessarily limited, and dealers may not be aware of the rules and regulations allowing a refund of the tax paid to the manufacturer. First, the city official in charge of purchasing must execute an exemption certificate furnished by the Treasury Department and turn it over to the merchant. This is then sent on to the manufacturer, who submits it to the Government as evidence in support of its claim for a refund. In addition to this certificate, the manufacturer must furnish proof that he paid the tax and did not pass it on, or that the tax was passed on but has been or will be repaid to the dealer; or, finally, that a written consent to the refund has been obtained from the dealer making the sale. Although not required by law, duplicate copies of purchase orders, invoices and other documents relating to the transaction should be attached to the exemption certificate furnished by the city, so that a complete record will be presented.

Executing Exemption Certificates

In filling out the exemption certificate, the city represents that these articles are being purchased for its "exclusive use," and the official signing it agrees to report to the manufacturer any "non-exclusive" use, such as a resale to employees. This means that any personal purchases made by municipal employees through city purchasing departments are not entitled to exemption. For example, if a police department orders a dozen revolvers which its members are to pay for out of their own funds, the sale is taxable. The same rule applies when the management of a public park, swimming pool or golf course requests the city council to order equipment and supplies which are to be resold to patrons. Since the original purchase is for resale, the municipality must pay the tax.

Municipal officials executing exemption certificates assume a definite responsibility. The Federal law states clearly that defrauding the Government of tax by the fraudulent use of these certificates renders "the undersigned and all guilty parties" liable to a fine of not more than $10,000, or five years in jail, or both. Congress probably intended to penalize only those officials who participated in an attempt to defraud, but the law is not clear, and it is possible that merely executing a certificate used for illegal purposes would be sufficient to incriminate the purchasing agent, comptroller or other official whose signature appears.

A period of four years from the date taxes were paid by the manufacturer is allowed in which to apply for a refund. In this way, cities which have overlooked their rights may yet take advantage of the liberal exemptions. The first step is to check with the dealers all invoices during the preceding four years, to determine whether the Federal tax was passed on as a part of the sales p[illegible]. This very often happens when the dealer is not fully aware of the provisions of the exemption law and has billed the city for a lump sum without itemizing the tax separately. The recent experience of a Midwestern city indicates that this is by no means a rare occurrence. In this community, there was no centralized purchasing department and the Superintendent of Public Works was authorized to purchase two trucks. A year later, this official was advised by the State Auditor's Office that no Federal tax should have been paid. Upon checking the records, it was discovered that the dealer had failed to separate the selling price from the tax, and by following the proper procedure, a sizable refund was obtained.

Other Available Savings

Further savings may be effected by taking advantage of other exemptions allowed by the Revenue Act of 1932. This Act levied a Federal tax upon payments received by telegraph, telephone, radio and cable companies for messages transmitted over their facilities. However, no tax need be collected on messages sent by the United States, or

Have you checked these possibilities for

SEWER-LINE SAVINGS?

ISN'T THIS TRUE? If you could reduce the grade of your sewer lines or use a smaller diameter pipe, the result would be substantial savings in installation costs.

And what improvements in sewer pipe are needed to give you these advantages? Just two things: a smooth interior surface and tight joints.

With a low friction coefficient, sewage flows readily, even on a slight grade. Trenches can be shallower, less expensive. And a smaller pipe will handle the same volume. When, in addition to a high flow rate, you add the advantage of tight joints, the grade or the pipe diameter can be still further reduced. With infiltration minimized, the line can be smaller, for it has less volume to carry. And there is an additional saving at the disposal plant, for there is a smaller volume of sewage to handle.

LONG LENGTHS of Transite Pipe reduce the number of joints . . . keep infiltration at the minimum. The result: greater efficiency of sewage-works operation due to less sewage for the disposal plant to handle. And on gravity lines, this longer pipe is easier to lay to exact grades.

Now consider these advantages of J-M Transite Sewer Pipe. It has an exceptionally high flow velocity—C-140 or n-.009 (for average slopes). Its long 13-foot lengths reduce the number of joints; and, even more important, the joints are tight. Infiltration is virtually eliminated.

Other features of Transite Pipe bring additional savings. It is comparatively light, easily transported to the job and rapidly handled by installation crews. The long 13-foot sections permit laying to exact grades with greater speed and accuracy. Its asbestos-cement composition provides inherent permanence and exceptional resistance to corrosion, both inside and outside.

You cannot afford to overlook the important economies made possible by Transite Pipe. Before you install your next sewer line, why not get complete information? For a copy of the new Transite Sewer Pipe Brochure, write Johns-Manville, 22 East 40th Street, New York, N. Y.

INSIDE AND OUTSIDE, Transite Pipe's asbestos-cement composition provides high resistance to corrosion. And the Simplex Couplings used on force mains assure bottle-tight joints.

Johns-Manville

Transite Sewer Pipe

AN ASBESTOS PRODUCT

any state, territory or their political subdivision and paid for out of public funds.

Another source of savings is contained in the exemption of sales to governmental bodies of electrical energies by privately owned companies. Although private consumers must pay a Federal tax at the rate of 3 per cent of the price of their bill for domestic or commercial use, governmental bodies are entirely exempted. In the above instances, municipalities must execute the necessary exemption certificate and turn them over to the company furnishing message services or electrical power.

A NOTE BY THE AUTHOR.—Because of space limitations, this article does not discuss state sales taxes. It should be pointed out, however, that some states exempt municipalities from payment of such taxes.

Exemptions from Federal excise taxes are granted under the following statutes and regulations:

Gasoline and lubricating oils.—Sec. 620 (a) (3) of the Revenue Act of 1932 as amended; Art. 24, Reg. 44.

Automobiles, motorcycles, radios, sporting goods, soaps and cameras.—Art. 17, Reg. 46.

Pistols, revolvers.—Sec. 600 (2) Reg. 47 (1928 Ed.)

Rifles, machine guns and the necessary shells and cartridges.—Sec. 610 (1) Revenue Act 1932; Art. 59, Reg. 46.

Transmission of messages by telephone, telegraph, radio and cable facilities.—Sec. 710 (b) Rev. Act 1932.

Refund procedure is prescribed by Sec. 621 Revenue Act 1932, as amended.

Developing a Metropolitan Area

Through Annexation of Adjacent Industrial and Residential Property

By GEORGE B. WATERS
City Commissioner, Houston, Texas

AS I see it, the primary reason why a city should extend its limits is to put itself in a position where it may plan for its own future growth and also that of the adjacent metropolitan area. The metropolitan area can never be an entity; its life-blood comes almost entirely from the heart of the city. Yet in Houston, as in many other cities, the suburban ring is not part of the city proper and is being left to the usual planless development which has proved so wasteful in the past. The hundreds of thousands of acres of land adjacent to nearly every metropolis are not properly zoned nor wisely subdivided, and in expectation of continued growth and appreciation in value, great tracts are held for purposes for which they will never be used. The question is: What can the cities, and Houston in particular, do to plan for a more orderly development of these outlying areas? Shall they be annexed as part of the city? Or shall some jurisdiction be exercised over them by methods already in sight?

In Houston, the case for annexation is receiving considerable attention. The catch-phrase, "The city can give the people in outlying areas nothing but a tax receipt," is not difficult to refute where suburban neighborhoods are properly planned. There are costly benefits of which all persons partake who live in or close to a great city. It is the view of city planners that if the outlying areas received nothing more than proper planning, the inhabitants would get more than their tax money's worth. Actually, they receive a great many blessings. They have the right to earn their living in the city. The presence of the metropolis gives value to the surrounding acres. The city has health programs; police and fire protection; good streets, properly lighted; large-scale, economical utility service; libraries and parks and recreation centers, all of which, and many other institutions, benefit the suburban areas to a greater or less degree.

Houston's suburban ring is estimated at approximately 19 miles in diameter. Houston's government is separate from the Independent School District which includes all of Houston and extends far beyond the city limits, taking in about as much land as would be included in this suburban area. It is an interesting fact that in 1937 40 new subdivisions were platted and approved by the City Planning Commission, and while only 11 of them were inside the city limits, the 29 outside the limits were within the school district. For the first month of 1938, 33 new subdivisions were filed for approval, 7 of them inside the city limits and 26 outside the city but inside the school district. This shows there is a strong demand for residential property that escapes city taxes but receives all the benefits of the great city and its school system. There is little danger that anyone who is brought into the city by expansion of the city limits will have to pay more than he is receiving in value.

Actually, the interest of a city in reaching out to take in more territory is not to gain a greater taxing value but to be helpful to the entire community. The various layers of county and city government could, through such a change, be pared down to one with a consequent unification of plan and reduction in waste. Where there is zoning in the city, the same principle ought to apply to the metropolitan area, and it would seem certain that a city could better plan a metropolitan area if it had actual jurisdiction over the territory. Streets, subdivisions, utilities, should be laid out according to a comprehensive plan based on extensive study of city growth and population needs.

Rural Planning and Municipal Land Reserves

Naturally, with such an extension of boundaries into the county for planning purposes, an understanding of rural development and rural zoning is necessary. The theory has been advanced—and I think it a good one—that only such rural land as is needed currently for building should be subdivided and developed. It is claimed that under no circumstances will more than 25 per cent of the metropolitan area of Houston, that land lying in the suburban ring, ever be devoted to residential building and homes, regardless of how it is done. Haphazard or planned, this is the limit. If haphazard, the other 75 per cent will be used for farms, forests, parks and *defunct subdivisions*. If planned, the farms, parks and forests will be better con-

South American City Uses This Fleet of New Internationals in its Street and Fire Departments

Above: Front view of an International Truck — equipped with water tank and sprinkler—doing an efficient job of street washing. The picture at the upper right shows another view of the same equipment.

At Right: The progressive Municipality of Vincente Lopez, Argentine, South America, recently acquired this modern fleet of International Heavy-Duty Trucks equipped for use as street sprinklers and washers and fire trucks.

INTERNATIONAL

Above: This shows an International Truck with street sprinkling equipment in action.

At Left: A demonstration of the fire extinguisher equipment which shoots a stream of water about 100 feet high.

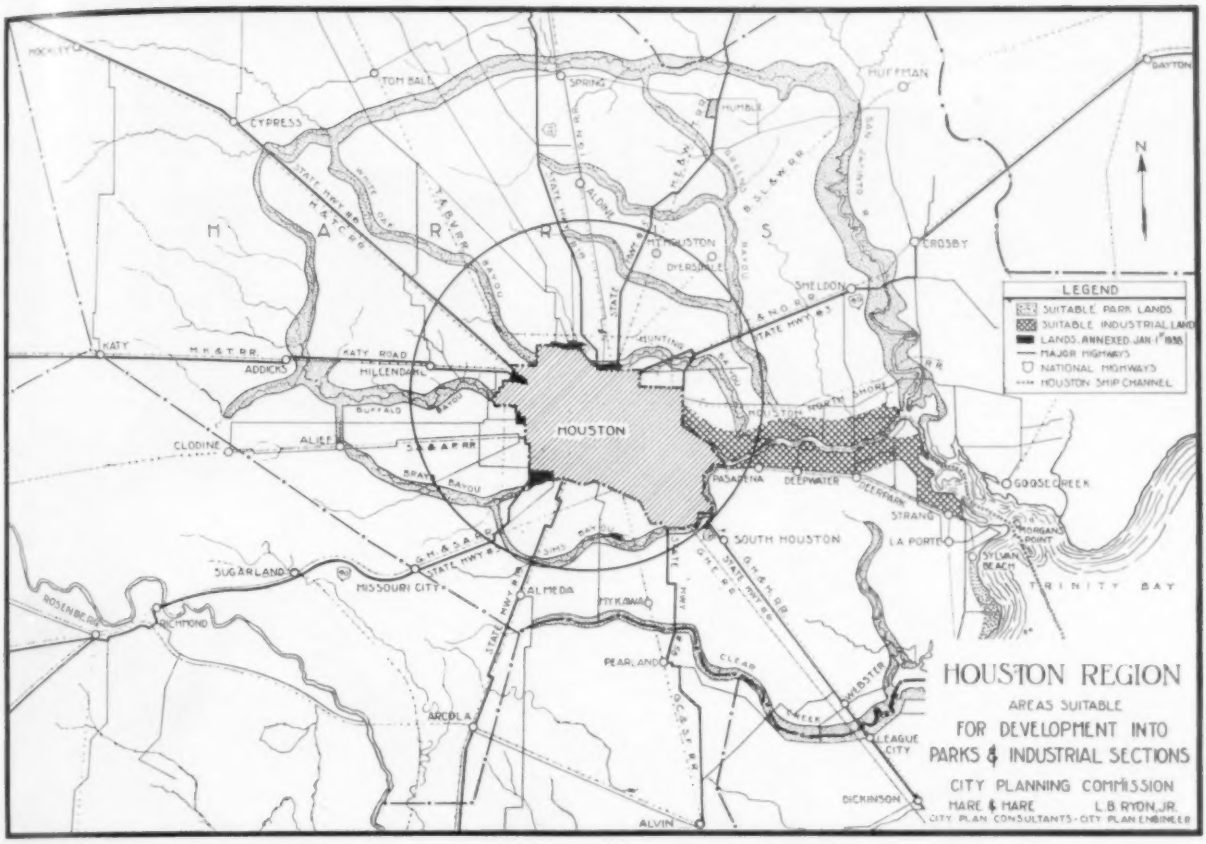
The fame and reputation of International Trucks go far and wide. Pictured here is a fleet of New International Heavy-Duty Trucks recently purchased by the Municipality of Vincente Lopez, Argentine, South America. The officials of this progressive city know the value of good equipment . . . that's why they chose Internationals when they were in the market for trucks.

When you examine and drive the New Internationals, you, too, will admire the many sound engineering improvements which are advancing the International reputation by providing peak performance at low operating cost. You get more for your truck dollar when you buy Internationals . . . the outstanding truck value on the market. Every type of work calling for trucks can be exactly suited by Internationals, available in sizes from the Half-Ton unit to the powerful Six-Wheelers. See our nearby Company-owned branch or dealer for complete details.

INTERNATIONAL HARVESTER COMPANY
(Incorporated)
180 North Michigan Ave. Chicago, Illinois

INTERNATIONAL TRUCKS

When you write for that catalog, kindly mention THE AMERICAN CITY.



served, and only the lands most economically suited to development will be used for community living. If we intelligently plan, those who seek surcease from the crowded and noisy city will find what they seek—a chance to live in the wide open spaces and enjoy a beautiful landscape, pleasant surroundings and modern conveniences.

It makes one dizzy wondering how all this can be brought about. How are we going to tell some big landowner, yea, many big landowners, out in the suburban ring, what use they shall make of their land? Cities, counties or states might buy up large areas, properly zone them and then resell to developers, cooperative housing organizations or government housing authorities. Houston is now investigating the feasibility of this. European countries have been accumulating land reserves for years for purposes of controlling expansion. In Texas we have a zoning law applying to cities, and another law giving us the right to approve subdivisions five miles in the country. If we should extend our limits, it seems reasonable that we could zone the rural or metropolitan areas. There is another law giving cities the right to create park districts, buy parks and charge them to the areas benefited. With our limits extended, we should be able to use this law in setting aside large sections of the suburban area for parks.

Recent Annexation in Houston

In the past year annexation has been actually employed in Houston to the extent of adding three sections, aggregating .888-square mile, to the area of the city. These three spots are on the west and south. The one at the top, shown on the accompanying map, is Eureka Junction and Washington Avenue; the one next beneath it is known as Briarwood, River Oaks and Lamar High School; and the one at the southwest is part of Braeswood subdivision. The Eureka Junction and Washington Avenue annexation took in some industrial property, much vacant land and a number of railroads; the Briarwood, River Oaks and Lamar High School extension took in one fairly well-developed subdivision and one just in process of development; and the Braeswood annexation took in a very fine residential development. The assessed value of Houston will be increased by $1,000,000 as a result of the extension.

At the present time the Houston City Planning Commission is making an exhaustive study of the advisability of a major city limits extension whereby most of the land in Houston's suburban ring might be taken into the city.

Fellowships in Street and Highway Traffic Control

THE Bureau for Street Traffic Research of Yale University announces the availability, beginning September 26, 1938, of fifteen graduate fellowships, each carrying a stipend of $1,200 and an additional amount not exceeding $200 for travel and field investigation. The regular annual fee of $400 for instruction will be deducted from the fellowship. This will provide each fellow with a net living stipend of $800 for the academic year.

The program of instruction has been arranged to provide the student with a broad foundation in the techniques of traffic control. The subjects covered have been selected to fit the needs of the traffic engineer in public office or in a traffic organization. The program is not designed to train specialists in any single part of the field. However, research facilities will be provided for any fellow in order that he may concentrate on a specialty for his thesis subject.

HOW TO KEEP YOUR CITY ON *Easy* STREET

Every citizen wants smooth streets that make driving a pleasure . . . streets that are easy on his car, easy on his pocketbook and easy on his temper . . . streets that draw trade to his city. A-C Speed Patrols will enable you to give him such streets and to keep them constantly easy to travel. Proper weight distribution between front end, blade and rear end gives you more effective blade pressure, consequently greater accuracy. As a result your operators do a smoother job. Speeds from 2.3 to 10 m.p.h. give them a right speed for every job—ditching, scarifying, grading, traveling, oil mixing, etc.—enable them to finish more blocks daily. Take the Speed Patrol way to streets that are easy on both you and the taxpayer. See your nearest Allis-Chalmers dealer.

No. 42 Single Drive Speed Patrol sta ing the job of smoothing a Taco (Washington) street. Used almost co stantly, it has operated two years wi out repairs.

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ALLIS-CHALMERS

TRACTOR DIVISION—MILWAUKEE, U. S. A

SPEED PATROLS

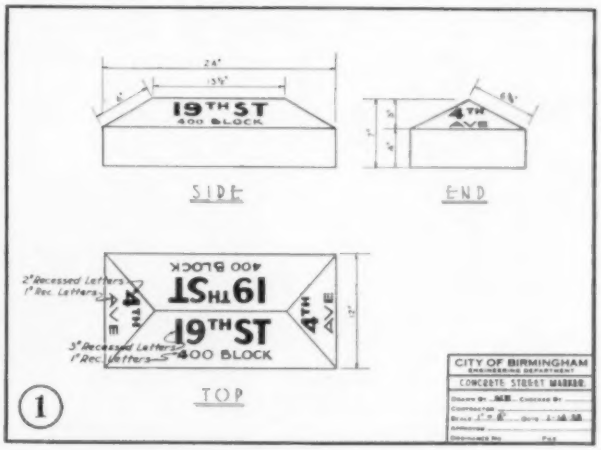
Concrete Street Signs

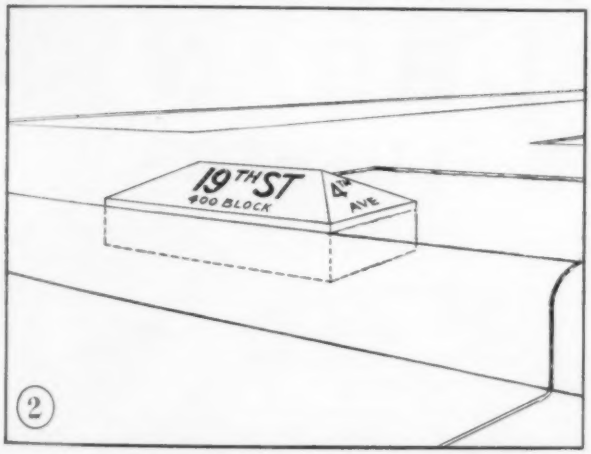
Birmingham, Ala., Has Prepared Design and Organization for New WPA Project

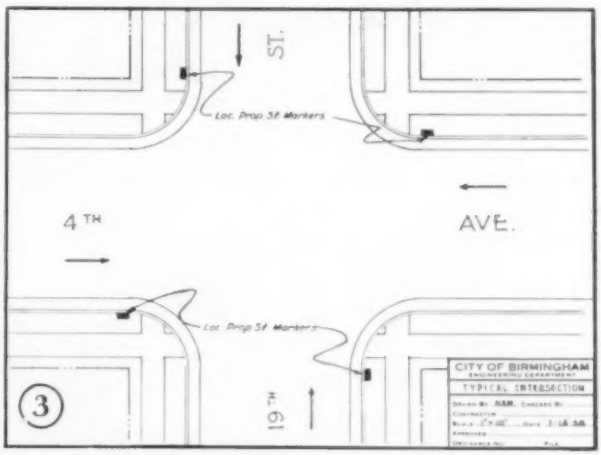
WITH the continuation of the need for projects in which relief labor can be used effectively and for the benefit of the community, the engineering departments of many cities are studying prospective projects with great care. In line with this policy of useful relief work, the Engineering Department of Birmingham, Ala., under the direction of J. D. Webb, City Engineer, has developed a new WPA project of particular interest. It involves the setting-up of an organization for the construction of new concrete street signs or markers to be placed at the four corners of all intersections.

The marker is a block of concrete 24 inches long and 12 inches wide, the top having angular faces in which the letters giving the street number or name and the block number are molded in the concrete and afterwards painted with a black enamel paint. This block will be set in the grass plot between the curb and the sidewalk, placing it directly against the curb and leaving the top portion of the block above the general surface of the sidewalk and grass plot.

It is proposed to construct the markers at a centrally located yard, making them complete and ready for setting. Then they will be delivered to the proper points and installed one street or avenue at a time throughout its entire length. The organization required for the production and installation of 120 markers per day will consist of 75 laborers working 8 hours per day for 20 days a month for 5 months.







PLANNING THE NEW CONCRETE STREET MARKERS FOR BIRMINGHAM, ALA.
1. Design of the marker. 2. A marker in place. 3. Locations of markers at street intersections

Town and Country Planning Summer School, 1938

To Be Held in Exeter, England, September 2-9

THE General Committee of the Town and Country Planning Summer School, of which Dr. Thomas Adams is President, has decided to hold the School this year at Mardon Hall, Exeter, England, September 2-9, by kind invitation of the authorities of the University College of the South West. Overseas delegates will be especially welcome.

The School fee will be 1½ guineas for the full week, and one guinea for the long week-end, which will include membership in the School, attendance at all sessions, and a copy of the proceedings when published. The terms for board and lodging, in addition, will be £3. 3. 0. for the full week (single room), or £2. 12. 6. for two sharing. The week-end board terms will be about £1. 1. 0.

The program of lectures will be issued as soon as possible, and those wishing to receive copies, or to have their names placed on the School Register, should communicate at once with the Hon. General Secretary, 26, Church Green, Witney, Oxfordshire. Those who have previously attended one of the Summer Schools, need not apply, as their names are already on the Register.

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SUBURBAN STREET FLUSHERS

THE moderate price of the SOUTH BEND Suburban Street Flusher places them within the reach of the smallest towns and villages. Ranging in capacity from 600 to 2100 gallons, they provide a complete line suitable for installing on a truck chassis of any size.

These Flushers, with one nozzle, clean a strip 14 feet wide; with two nozzles, 26 feet wide and with three nozzles, 36 feet wide, in one operation. They remove from the pavement the finest dust particles as well as the heaviest kind of street dirt and litter, leaves, etc. Leaves are washed into the gutter. Being wet, they do not blow back. Snow and slush are washed away, too, when temperatures are mild. The street need not be cleared of cars before a SOUTH BEND Street Flusher goes through. The SOUTH BEND cleans *under* cars parked along the curb.

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Bronze-Welding of Cast Iron Pipe

By DR. J. T. MACKENZIE
Metallurgist, American Cast Iron Pipe Company, Birmingham, Ala.

REALIZING the importance to the trade of having a dependable and serviceable method of welding plain end cast iron pipes, The American Cast Iron Pipe Co. has made extensive experiments and a careful study of the different types of welds, such as the bronze weld, and the cast iron fusion weld. Each type has been carefully tested and the results compared with the full cross-section strength of the pipe.

Procedure for Bronze Welding

Two methods of bronze welding have been studied and found satisfactory, namely, the collar type weld and the shear vee type. The following general instructions are to be followed in both methods.

Preparation of Pipe.—For the collar type weld use plain end pipe arranged as shown on Fig. 1.

For the shear vee type, bevel the ends and machine a shear shoulder as shown on Fig. 2.

The outside surface of pipes should be thoroughly cleaned in the weld area.

Materials.—Only the highest grade bronze welding rod and commercial fluxes are recommended.

Welding Procedure.—(A) Place pipes on suitable skids or rollers in order to maintain proper alignment during the welding operation.

(B) Separate abutting ends about 1/16-inch.

(C) Before applying bronze, heat pipe in weld area to a cherry-red.

(D) The adjustment of blowpipe flame varies with the type weld: in the collar type, an excess of oxygen speeds welding without detriment to the weld; in the shear vee type, the flame should be neutral to prevent overheating the top of the vee and shear shoulder before the bottom of the vee is heated sufficiently to tin properly, and also the neutral flame has less tendency to burn the bronze.

(E) Warm the bronze rod and dip in flux, then rub lightly on heated pipe under the flame. By moving the rod in a slight arc under the flame, the first ripple or lap is formed; then the flame is moved ahead, preheating the pipe for succeeding ripples until the entire circumference of the pipe is welded.

(F) Keep pipes evenly supported until the bronze has cooled below its plastic state.

Comparison of the Two Types

The collar type takes less bronze and is much faster to construct than the shear vee type. The shear vee type, owing to its construction, is stronger and is to be desired if the weld is subject to unusual shocks or stresses.

The collar type is the more economical and for ordinary conditions should be satisfactory.

Procedure for Cast Iron Fusion Welding

Preparation of Pipe.—Bevel abutting ends of pipe to 45 degrees, giving a 90 degree vee shape when pipes are brought together. The outside surface of the pipe should be thoroughly cleaned for at least ¾-inch adjacent to bevel.

Materials.—Only the highest grade cast iron welding rod and commercial fluxes are recommended.

Alignment—Allowance for Expansion and Contraction.—Allowances must be made for the warping effect of the expansion and contraction of the metal during welding. This allowance varies with the metal thickness as well as the diameter of pipe. It is also affected by the lengths of pipe welded, the longer lengths tending to counteract this warping or upturning effect. No definite values have been established as yet for these various factors, the allowance

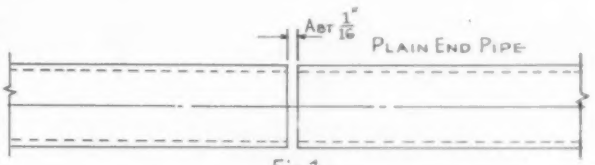


Fig. 1
ARRANGEMENT OF PIPE FOR COLLAR TYPE WELD

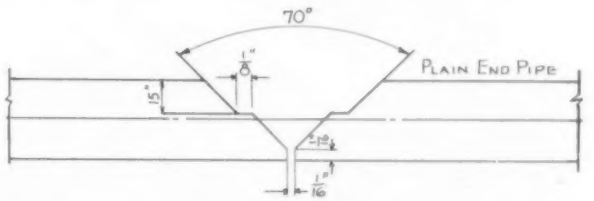


Fig. 2
SHEAR VEE

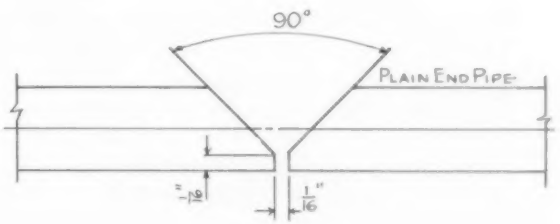


Fig. 3
PIPE BEVELED FOR C.I. FUSION WELD

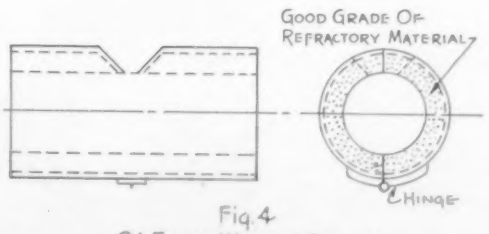
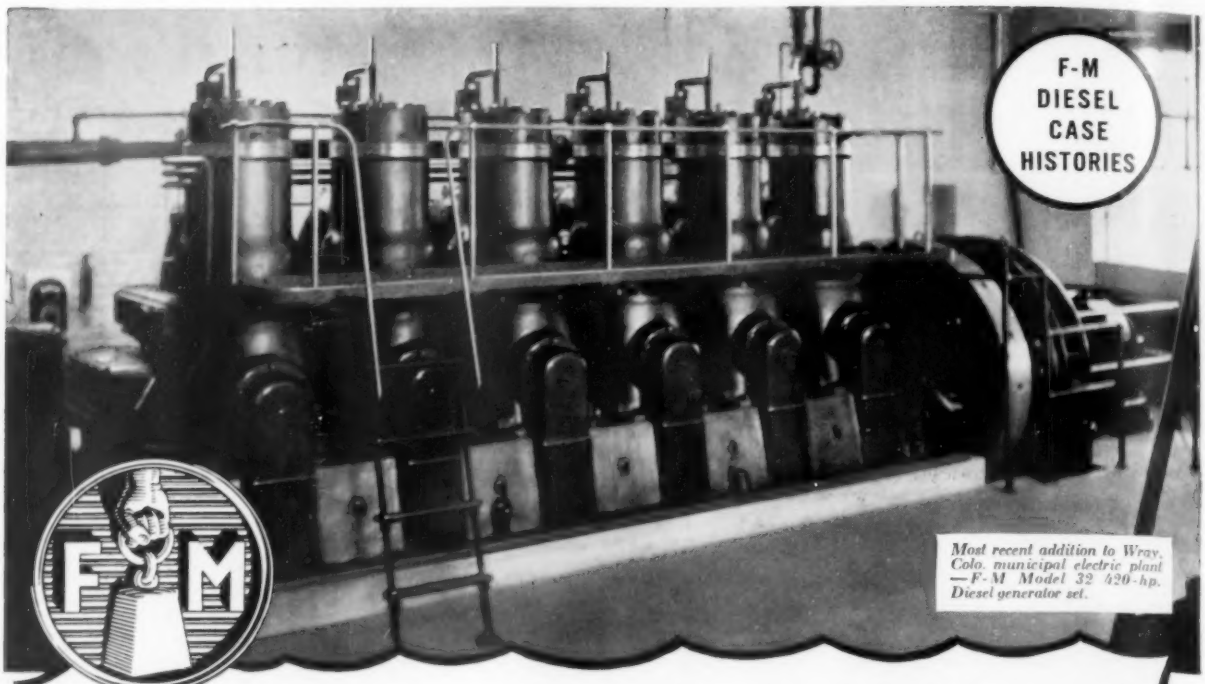


Fig. 4
C.I. FUSION WELDING COLLAR

TYPES OF WELDS



Most recent addition to Wray, Colo. municipal electric plant —F-M Model 32 420-hp. Diesel generator set.

Municipal Power Plant Earns $20,000 in Year

TWO rate reductions plus a profit of more than $20,000 in a year is the short story of the Wray, Colorado municipally owned electric power plant since changing from steam to Fairbanks-Morse Diesel Power.

After inspecting 26 different Diesel-operated plants, two Fairbanks-Morse Two-cycle Model 32 Diesel generating sets were purchased. Later, due to increased demand, another F-M Diesel generating unit was purchased—this one driven by a Model 32 420-hp. Diesel.

Over a period of approximately three years, all three of these F-M Diesel units produced current at a fuel cost of less than one-half cent per kilowatt hour. The total bill for repairs was about $15, and a typical year of operation showed $20,897.99 profit after labor, fuel oil, lubricating oil, and distributing cost had been deducted from total income.

If the citizens of your town want lower taxes (and who doesn't!), investigate Fairbanks-Morse Diesel Power. Almost without exception it is the same story over and over again: *When F-M Diesel Power goes in, down go taxes—down go power rates.* Write Department 1, Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Ill. 35 branches throughout the United States at your service.

When it's even too hot for a Hottentot, *COMFORTIZE* with Fairbanks-Morse air conditioners.

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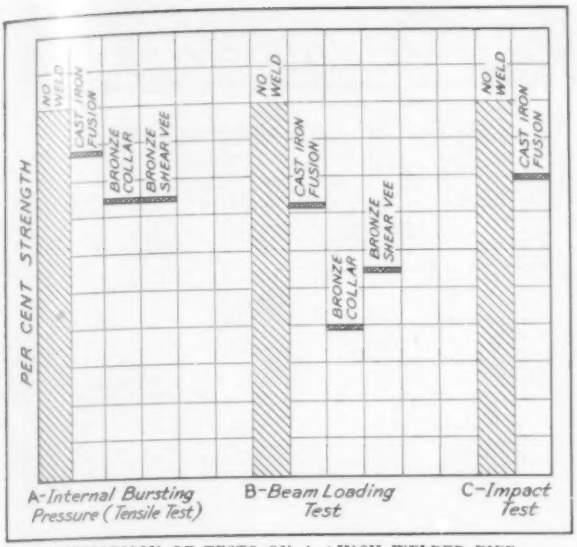

COMPARISON OF TESTS ON A 6-INCH WELDED PIPE

made depending upon the judgment and experience of the welder.

A gap of 1/16-inch is left between the abutting ends of pipe where welding is to start, as shown on Fig. 3. Around the circumference of the pipe 180 degrees the gap is 1/16-inch plus the allowance for warping discussed above.

Welding Procedure.—Before aligning the pipe, a dry sand core of practically the same diameter as the inside of the pipe is inserted at the abutting ends. This core prevents the collapse of the pipe wall during welding and retains heat to prevent rapid or uneven cooling of the weld. After the pipe is aligned, a refractory lined hinged collar is placed around the pipe over the joint, and the welding is done through an aperture of the collar (Fig. 4). This collar is essential to prevent uneven cooling and retains the heat. The torch should be adjusted to a neutral flame using the lowest pressure of oxygen, regardless of the size welding tips used.

The pipe should be brought to a fusion temperature, the rod warmed and dipped in a good grade of commercial cast iron flux, and then the rod and flux applied to the molten metal. The molten puddle should be three times the metal thickness in width and extending the full thickness of the pipe wall in depth. During fusion, the puddle should be constantly agitated with the welding rod down to the inside core, in order that slag and impurities may float to the outside. Continue around the entire circumference of the pipe and then re-work at least two inches beyond the start of weld to eliminate any blow holes in the first metal laid down.

As soon as the welding is completed, the opening in the welding collar is covered with asbestos, and the collar is left over the joint for at least one half-hour to remove possible welding strains.

It has been found that, when using the heat-retaining collar, the welding tip should be about two sizes smaller than those used without the collar to prevent oxidizing the iron.

Tests on Welded Pipe

Pipes which were joined together with the various types of welds have been subjected to the accepted standard tests for cast iron pipe—(a) internal bursting pressure, (b) beam loading and (c) impact, and the results compared with the full cross-section strength of standard pipes without welds.

Bursting Tests

These tests were made on pipe 16 feet long. The tests on welded samples were made with the weld in the center. Standard bell-and-spigot plugs and caps were calked in the ends as in standard field practice. Each sample was then placed in a structural steel frame to restrain the calked fittings. The internal pressure was then slowly raised till failure. Failure pressures were read on calibrated hydraulic gages.

Beam Test

Beam tests were made on the full-length pipe in each test. In the case of welded pipe, the weld was placed midway between the supports. The supports were 15 feet apart and the load was applied at two points, each 5 feet from the support. The tests were made on a 200,000-pound testing machine.

Impact Test

Impact tests made on full-length pipe bedded in moist sand with 50 pounds per square inch internal water pressure maintained while subjected to repeated blows of a 50-pound falling hammer. Height of drop started at 3 inches and raised in increments of 3 inches for succeeding blows until failure of pipe. Hammer dropped directly on weld.

The bronze weld joint does not lend itself to the standard method of impact testing, since the bronze is soft and ductile and cushions the blow of the hammer. From all indications, the bronze weld joint has no weakening effect on the impact resistance of the pipe itself, and the weakening effect of the cast iron fusion joint is slight as evidenced by the height of drop of the hammer as shown on the accompanying charts.

Corrosion of Welds

It is practically impossible in any welding operation to produce a weld metal which has exactly the same structure as that of the metal being welded. This means, of course, that if the welded structure is exposed to an electrolyte, such as very wet mucky soil, brackish water, or sea-water, galvanic currents will be set up which will cause attack on that part of the metal structure which is anodic.

Galvanic action of this type becomes serious only when the positive or anode part of the structure is small in area as compared to the cathodic part of the structure. For example, if a bronze or brass coupling is used to connect two iron pipes, the coupling is cathodic, the corrosion takes place on the pipes, and is spread out over a relatively large area so that the attack is usually not severe at any one point. However, if brass or copper piping is joined by a coupling of ferrous metal, the galvanic attack is concentrated on the anodic coupling, and in such cases the coupling is often completely destroyed in a short time. Another point worth mentioning in this connection is the fact that where the cathode is small in area compared to the anode, the reaction is cathode-controlled. That is,

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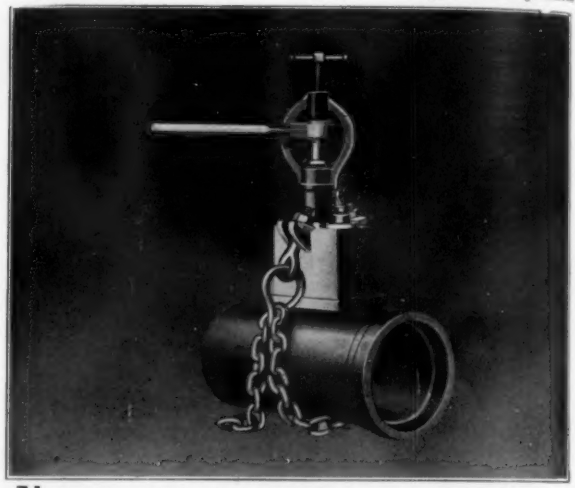
37 M—Tapping and Inserting Machines and Accessories

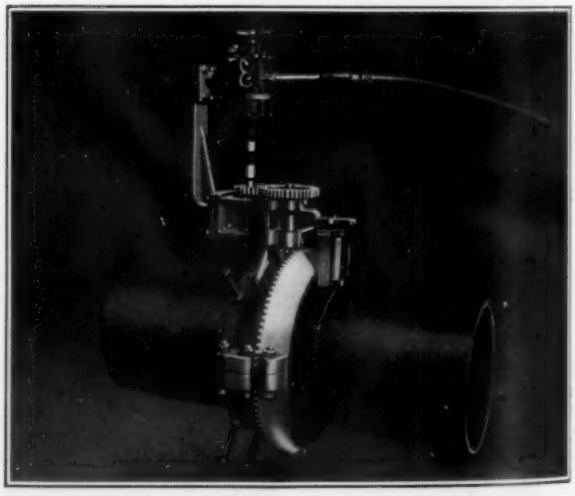


Above — SMITH CORPORATION TAPPING MACHINE Simplest, lightest, strongest, most economical and easiest-handled machine for inserting corporation cocks in your water mains. #1 makes ½ in., ⅝ in., ¾ in. and 1 in. insertions; #2, 1 in., 1¼ in. and 1½ in. insertions; #3 makes 1¼ in., 1½ in. and 2 in. insertions.

Complete Catalog on Request

SMITH CURB COCKS are made specially heavy, to withstand rigid service. Made in all types and styles.

At right — Portable SMITH PIPE CUTTING MACHINE—either hand or power-operated. Can be used on either cast iron or steel pipe with a change of cutting tools. Five sizes cut all pipe from 4 inches to 48 inches. All sizes can be fitted for air motor operation. *Getting a clean cut on the first try saves money as well as time.* Smith Pipe Cutters pay for themselves over and over again in the average busy water plant.



THE A. P. SMITH MFG. CO., EAST ORANGE, N. J.

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the progress of the reaction is governed by the amount of oxygen available to remove the hydrogen formed and to depolarize the cathode. For this reason where the reaction is cathode-controlled, the total amount of corrosion is often actually less, because oxygen cannot be supplied fast enough to allow the reaction to proceed normally.

The polarity of welds may be determined most easily by what is known as the agar test. A machined section of the pipe wall through the weld is placed in a clear agar jell which contains dissolved sodium chloride, potassium ferricyanide, and phenolpthalein. The same solution serving as an electrolyte, any galvanic action starts immediately. Anode points are revealed by the fact that iron going into solution reacts with the potassium ferricyanide to produce a deep-blue color in the jelly adjacent to any anode point. Cathode points are shown by a red color in the jell, which is caused by the sodium hydroxide forming at the negative poles and changing the color of the phenolpthalein.

Labor and Materials Required for Welding

The figures below were assembled to give a comparison of the cost for making the two types of welds discussed in this paper. In each case the figures were taken from approximately 100 welds made during a regular work-day in the line of production. These welds were made on a special line of pipe manufactured at Acipco and therefore are of no value except in a comparative manner.

	Bronze Collar Type	Cast Iron Fusion
Time required for making weld in minutes (welder and helper)	7.38	15.79
Cubic foot of acetylene	2.08	3.30
Cubic foot of oxygen	2.44	4.34
Welding rods in ounces	2.25	2.28
Flux in ounces	0.12	0.11

Note.—No extra cost is shown for preparation of pipe for welding.

ACKNOWLEDGMENT.—A paper presented at the 38th Annual Convention of the International Acetylene Association, Birmingham, Ala.

Perth Amboy Reclaims Valuable Waterfront

THREE projects, which will effect a major reclamation of the waterfront and for which Federal funds of $470,000 and city funds of $79,535 have been allotted, are nearing completion at Perth Amboy, N. J. They have provided employment for an average working force of more than 175 men during the past two years, their wages being paid by the Works Progress Administration.

Included in the benefits to be derived from these projects are a boat basin within whose 149,225-foot area will be anchorage for more than 100 privately owned pleasure craft, a 790-foot beach, a new street running 9,225 feet along the shore, and the demolishment of more than a score of condemned barges from which lumber was salvaged to build the boat basin.

The project to improve the waterfront area was by far the largest of the three. Raritan Boulevard, the new street cut through under this project, is complete with 8,800 lineal feet of sidewalk, curbs and gutter, catch-basins, manholes, and sewer and 1,015 lineal feet of storm drain. A low area, 400 feet long, was filled and over the entire stretch 16,500 square yards of penetration macadam was laid. Grading on both sides of the 36-foot street, erection of 18 electric light standards and connecting cables, and completion of a 7-acre park with concrete walks, playground equipment and landscaping, and improvement of seven streets leading into Raritan Boulevard, complete the work done behind the bulkhead.

The 790-foot stone bulkhead, hand-laid, parallels the street and required 60,000 tons of stone. Four stone jetties, aggregating 600 feet, will protect swimmers from rough water. The area will be dredged by the city, excavated material being used to fill the space between street and bulkhead.

A narrow stretch of land separates the beach from the boat basin, which is 635 feet long. The bulkhead sheeting of longleaf pine, sunk 20 feet into the river-bed and rising 12 feet above, formerly served as bracings in the barges, while the 1,000 oak and pine piles driven were pulled from disused docks below the present structure. Spikes and bolts also were salvaged and used in the basin. Four docks extend from 200 to 269 feet into the Kill van Kull. They are 10 and 12 feet wide with 3-foot catwalks fixed to outriggings 4 feet below the deck to permit easier access to small boats. The shortest dock will be used by trucks hauling supplies for boatmen. WPA work still to be done on this project consists of driving a few more piles to complete the truck dock.

THE NEW RARITAN BOULEVARD ALONG THE WATERFRONT, PERTH AMBOY, NEW JERSEY

At the south end of the bulkhead is a ramp for hauling boats out of the water. The strip of land between the street and bulkhead, ranging from 30 to 60 feet, will provide ample room for a marine railway and turntable to store boats over winter.

The city will dredge the basin to create a 7-foot depth at low tide. The fill will be pumped into the area between the street and bulkhead to provide the storage grounds.

Close to the boat basin are two yards in which the barges are being torn apart. Approximately 15 per cent, or 300,000 board feet, of the lumber has been salvaged, while the remainder is cut up into firewood and issued to families on relief. Last year 400 cords of cut wood was distributed, a half-load to each client possessing a card signed by the city's relief agent.

THE MUNICIPAL INDEX FOR 1938
is now being distributed. Apply for your copy to the publication office, 470 Fourth Avenue, New York.

Here's the ANSWER

TO YOUR REMODELING PROBLEM

● Rustable piping which has been in service for a number of years may still appear to be in fair condition if you judge by outside appearances, but it is almost a certainty that the walls of the pipe in many places have been reduced by corrosion to such an extent that it is only a matter of hours or days until a leak occurs. More than that, the conducting area of the pipe ha been greatly cut down by the accumulation of slime and corro sion. Replacements must be made, year after year, till they ar almost taken for granted—a necessary evil that can't be helped.

But this condition can be remedied—remodel with non-rusting copper—STREAMLINE Copper Pipe connected with STREAMLINE Solder Fittings. Don't make the mistake of replacing worn-out, rusted piping with more piping that will again in a few short years begin to give trouble in exactly the same way.

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Use of Asphalt as Protection for Reservoirs and Dams

By J. E. BUCHANAN
Research Engineer, The Asphalt Institute, Pacific Coast Division

THE use of asphalt for all kinds of street and highway paving is so universal that no question now exists concerning the desirability of such use. Main attention regarding pavements is now being centered on greater economy, new and improved methods, utilization of a wide range of aggregate, and a host of other improvement objectives, but the fundamental question—Is asphalt a suitable material?—is not involved. While this situation exists regarding pavements, there are other engineering problems wherein the use of asphalt appears feasible and promising, but such use is not fully established as yet on the basis of long service record.

The control of water and the prevention of erosion are fields wherein asphalt can play an important part. Some pioneer work has already been done which is indicative of future possibilities. Much experimental work remains to be done before the limitations and advantages of asphalt can be fully determined. Because there is growing interest in water control and erosion prevention, there are assembled in the following paragraphs a few examples of the use of asphalt that may serve as suggestions or guides to those who are confronted with similar problems.

Reservoirs

Storage of water in earthen reservoirs frequently necessitates a protective lining to eliminate percolation losses, to prevent wave erosion and to facilitate cleaning. Asphalt is beginning to develop a place among the various materials and methods used for lining reservoirs, although the possibilities have not been fully explored. There are in existence, however, enough examples of such construction with long and economical service records to warrant attention.

Sautelle Reservoir was constructed in 1925 by the Los Angeles Bureau of Water Works and Supply. Its principal dimensions are:

Maximum height of embankment	34 feet
Capacity	110 acre-feet
Area of water surface	7.20 acres
Side slopes	2:1

In 1929 this reservoir was given a 3-inch mixed-in-place asphaltic lining. Natural material composing the banks was rather well graded from one inch to dust. This aggregate was scarified and cultivated to a depth of 3 inches. Liquid asphaltic material SC-2 was then applied in increments with continuous mixing by harrowing and disking until a total of 2 gallons per square yard had been applied and uniformly mixed. This mix was then compacted by rolling. Side slopes were compacted by a front wheel of a tandem roller operated by cable from a truck. Following this, a heavy seal coat of one gallon per square yard of 150-200 penetration asphalt was applied. Cost records unfortunately are not available, but this lining has given excellent service. To date, the only maintenance which has been required was done in 1936, at which time about 6 tons of asphalt premix were used for patching scattered areas around the reservoir at the water line.

Arlington Reservoir, of the Citizen's Land and Water Co., at Riverside, Calif., was constructed in 1930, at which time it was given a 2-inch asphalt lining at a cost of 56 cents per square yard. It is a 3,000,000-gallon reservoir with 3:1 side slopes. The natural soil composing banks and bottom is disintegrated granite, well graded from ½-inch down. This soil was scarified and cultivated to kill weed growth and to produce aggregate for the asphalt lining. A total of 1¾ gallons per square yard of SC-2 liquid asphaltic material was applied in increments, mixed, and compacted by rolling. Then hot asphalt, 200-350 penetration, was applied at ½-gallon per square yard and covered with 30 pounds per square yard of 1 x ¼-inch crushed rock, and again rolled. This was followed by ⅞-gallon per square yard of hot asphalt, a cover of clean coarse sand, and further rolling. In 1936 this reservoir was cleaned and surface-treated with ¼-gallon per square yard of hot asphalt covered with clean sand. While this last treatment was applied six years after the initial lining, it could have been included in the original construction. Features of this reservoir include 3:1 bank slopes, a 6-foot walk and apron around the top, a service driveway formed in one corner, and special inlet and outlet pipes.

Iron Mountain Reservoir, of the Metropolitan Water District of Southern California, was given a 6-inch asphaltic lining in 1937 at a construction cost of 37¾ cents per square yard, exclusive of District engineering and administration charges. This is one of the reservoirs on the Colorado River Aqueduct System. The actual area of asphaltic lining in this reservoir is 51,498 square yards. The natural material on the floor of the reservoir showed an average grading as follows:

Passing ¾-inch round	90 per cent
Passing No. 4 sieve	70 per cent
Passing No. 10 sieve	58 per cent
Passing No. 50 sieve	28 per cent
Passing No. 200 sieve	4 per cent

This aggregate was gathered into windrows on the reservoir floor in sufficient quantity to provide a 6-inch compacted layer over the floor and sides of the reservoir. Liquid asphaltic material SC-2 was then mixed with the windrowed material by a Woods traveling mixing plant at the rate of 4 to 4½ gallons per square yard of reservoir surface. The mixed material was then spread uniformly over floor and sides and compacted by rolling. A seal coat of 150-200 penetration asphalt was then applied in two coats at the total rate of ⅝-gallon per square yard, following which 30 pounds per square yard of mineral aggregate passing a ⅜-inch mesh was spread, broomed, and lightly rolled.

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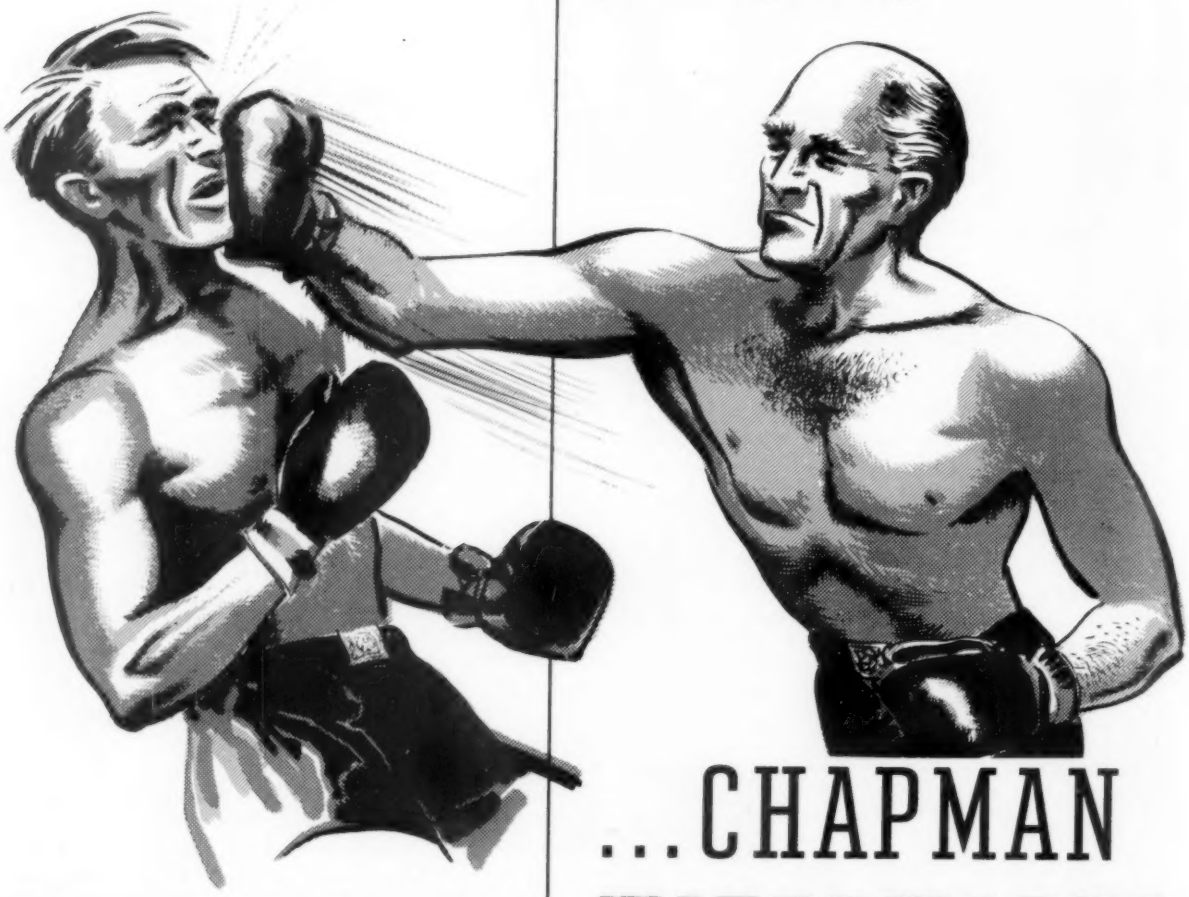

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Design and Construction Points

Experience with asphaltic reservoir linings is not as broad as is the case with highway construction, but the examples cited indicate that the same general methods of construction are applicable with slight modification. There is every reason to believe that successful and economical asphaltic reservoir lining may also be accomplished using hot premix, with or without reinforcing, following the methods subsequently described for bank protection. On the basis of performance records of a good many reservoirs in Southern California, certain basic points must be considered in designing and constructing asphaltic reservoir linings. These are:

1. The asphaltic lining is flexible, within limits, and conforms with the bank or base on which it is laid.
2. The asphaltic lining is a waterproofing and erosion-preventing agent only and not a structural element.
3. The reservoir embankment should be constructed following accepted procedure for earth-dam construction.
4. Sides and bottom carrying the asphaltic lining must be firm and compact, and sterile as regards weed growth.
5. To be successful, the asphaltic lining itself must be well compacted and impervious. If a seal coat is used, such seal should be rather heavy and covered with mineral aggregate.
6. Outlet and inlet works should be designed so that water currents in the vicinity of such works will not create excessive drag or impact on the asphalt lining.
7. Banks should be protected by some effective cut-off against the possibility of penetration by burrowing animals.
8. Inside slope of banks should not be steeper than 2:1, and preferably not steeper than 3:1.
9. The asphalt lining should be extended a reasonable distance across top of bank and sloped away from the reservoir to form an apron and walkway around the reservoir.
10. Berms and back slopes may be sodded, or they may be treated with a simple penetration of low-viscosity asphaltic material to prevent erosion by wind and rain.

Dams and Spillways

The problem of protecting and waterproofing the upstream face of an earth dam is practically the same as that involved in reservoir lining. There are in existence, in the region around Los Angeles, several dams which have been faced with asphalt, using methods and materials previously described for reservoirs.

Another contemplated use for asphalt in earth dams is in the upstream or impermeable section or core. It is significant that dense-graded asphaltic mixtures which have been developed for low-cost highway pavements employ an aggregate gradation similar to that which has been developed for earth dams. It is also interesting that the same methods of compaction are applicable in both cases. Consequently, the idea of employing asphaltic mixtures in cut-off trenches and in the upstream portions of earth dams is being considered.

Another interesting use of asphalt in earth-dam construction is illustrated in the case of a project now under construction near Upland, Calif. Present plans call for an asphaltic membrane to be placed in the upstream portion. This membrane will extend from the cut-off piling cap, through the dam to within 4 feet of the top. It will be constructed by first penetrating the 2:1 slope with a cut-back asphalt, then covering this prime with asphalt-saturated burlap, and finally applying a heavy seal coat of asphalt cement. The upstream face will then be built to a 3:1 slope, thus covering the membrane.

Flood control works of the Los Angeles County Flood Control District include a débris or stilling basin at the mouth of canyons wherein material eroded by rapid run-off is deposited and thus eliminated from the natural and artificial channels that carry this water to the sea. Some basins were provided with timber spillways, but these were relatively short-lived owing to the terrific abrasion to which they are subjected. The district elected to pave one of these spillways with asphalt. The timber spillway was surfaced with asphaltic concrete 3 inches thick, reinforced with wire fencing, which was in turn anchored to the timber structure. The asphaltic mixture was composed of ⅜-inch maximum size, dense-graded aggregate, and 8 per cent of 40-50 penetration asphalt. This paving cost 13 cents per square foot. After one season, during which 10,000 cubic yards or more of sand, gravel and boulders passed over it, the asphalt paving had naturally suffered damage and wear, particularly at the top of the spillway where the gradient is angular instead of curved, but it illustrates the usefulness of asphalt. In this case the spillway structure was protected and preserved, and the asphalt paving may be repaired to serve during the next season.

ACKNOWLEDGMENT.—From a paper presented before the Eleventh National Asphalt Conference, Memphis, Tenn.

THE DECENNIAL INSTITUTE OF GOVERNMENT

PREPARATIONS are well under way for the decennial session of the Annual Institute of Government. This intensive one week of study program which is dedicated to the professionalization of the public service will be held this year June 13 to 17 inclusive, on the campus of The University of Southern California.

The Institute was started in 1928 at the urging of public officials who were convinced of the value of a training center for civic workers in all fields. Last year more than 2,000 public officials and employees attended the sessions. Tentative plans for the current year call for thirty sections devoted to various phases of governmental activity to be included in the Decennial Institute. In these sections some 200 problems confronting the public service will be carefully considered.

Those attending this session will have the opportunity to attend lectures and discussion groups in other fields in addition to participating in all of the meetings of the particular section program in which they may be interested. The section programs are arranged to furnish addresses by nationally recognized authorities, followed by round table discussions led by local experts.

In addition to these specialized meetings, two general assemblies are to be held each day. The morning assembly will be devoted to a consideration of the general principles of government. "Man-Power in Government" will be the topic of the afternoon assemblies.

A new feature of the Institute this year will be the series of citizen suppers held throughout the week. The purpose of the suppers is to interest citizens in the various phases of governmental activities discussed at the Institute, and to convey to the public the aims and problems of government administrators and employees.

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Municipal Airport Problems

A Portion of the Discussion by Colonel J. Monroe Johnson, Assistant Secretary of Commerce, before the 1937 Annual Conference of the United States Conference of Mayors

ARE transport aircraft outstripping the ground facilities available for their take-offs and their landings? Are existing airports now being "outmoded" —being rendered obsolete or, at any rate, obsolescent—by the size, design, and engine-performance of the biggest new "luxury liners" of the skies? And if the best new planes should not be able to use our better modern airports with safety and convenience, what measures must be taken to emerge from the dilemma? Are our municipalities in a position to solve the problem adequately, with the aid and guidance of the Federal Government?

These are in no sense rhetorical questions. They are immensely practical questions which are facing us all at the present moment, demanding the wisest thought and best abilities if they are to be answered satisfactorily.

Length of Landing Strips

We know that some of the planes which served us well in earlier days could take off with a full load in less than 400 feet because the early engines were designed so that the full power output was operative at sea-level. For this reason, too, they possessed a remarkable degree of maneuverability. But today an entirely different picture is presented. There is, for instance, the matter of wing-flaps on the larger modern aircraft. Wing-flaps make it possible for planes to meet the landing speed requirements fixed by the Bureau of Air Commerce, but they have not aided the take-off. This factor of design has involved a faster take-off speed and this necessitates a longer take-off run.

The longer take-off run is of course an unavoidable consequence of the sheer bulk and weight of the new planes, operating under the imperative need of carrying every possible pound of pay load. Gradually, then, we have been witnessing longer and longer take-off runs. And still longer ones are ahead. Even now, the 1,000-foot limitation on such runs which was fixed by the Department of Commerce in 1929 is being pushed very close by many of the planes in use today.

All this means that longer runways and, in general, more space are becoming indispensable at many of our airports. Longer runways are needed for one important reason other than the number of feet required for the take-off. Modern twin-engine aircraft can fly with full load with one engine inoperative provided they have reached a certain minimum speed which is somewhat loosely designated as "single-engine speed." But this single-engine speed is higher than take-off speed. Thus, as an engine gets into the air, there is, inescapably, a brief interval between the "take-off speed" and the attainment of the "single-engine speed" where safety lies. Should there be engine-failure at the take-off, the plane would have to descend. But where? Since the big modern transport is less maneuverable than the older, smaller planes, it is obviously desirable that, in the event of one engine failure following the take-off, it should be able to proceed straight ahead and come to earth again within the limits of the airport.

The need for greater space in this particular connection is just one more consideration reinforcing our conviction that many contemporary airports are either actually or potentially inadequate and that we need to look intelligently to the question of their enlargement or to the construction of other airports on different and more suitable sites. We must be realistic about this matter. And the cold fact staring us in the face is the realization that within the next twelve months there will be mammoth transport planes in the air which, in all probability, cannot satisfactorily use more than five or six, at most, of the airports in this country in their present condition.

Traffic Congestion

Traffic congestion has been developing at some airports. This problem has become genuinely pressing—so much so, in fact, that at more than one airport it has been thought necessary to refuse the use of the field to individual owner-fliers and to miscellaneous aerial service operators. This is a disturbing situation, involving an element of injustice. It hardly squares with one's conception of right to see the citizens of a municipality who own and fly private planes debarred from using their municipal airport to which they have contributed financially, because all the facilities are needed by commercial airlines to serve the public transportation demand. This perhaps may mean a two-port necessity to solve the problem.

A Great Investment

These anomalies and incongruities in the airport picture bring us back to one basic fact. Three hundred and forty-two million dollars have been spent by municipalities and commercial companies and the Federal Government in bringing our airport system up to its present form, yet we are obliged to admit that much of this money has been expended without proper regard to any fixed national plan. Surely we shall be inexcusably unwise today if we do not take advantage of the lessons of the past; we simply must not continue to go along without a national plan based upon the sound ideas of all the interests concerned with the progress of civil aviation.

Confused and somewhat baffled, municipalities have wondered what the airport situation actually is and, more especially, what it is going to be. How big must an airport really be? Just when can it be considered permanently satisfactory? Precisely what is the ultimate goal? How

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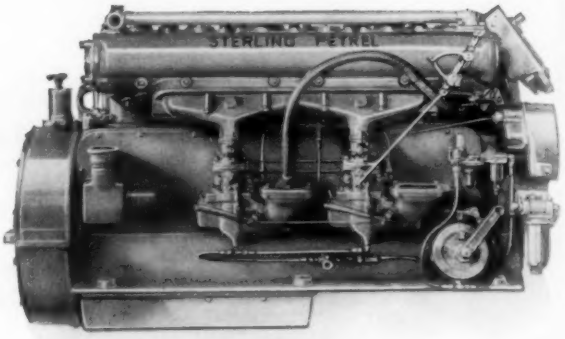

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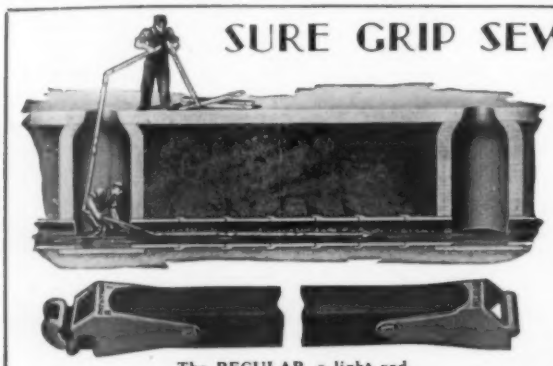

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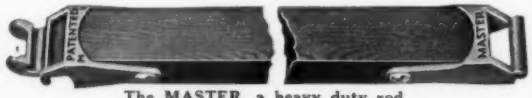

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Fig. 67
A.W.W.A.

can we intelligently and finally adjust ground facilities to aircraft? Municipal authorities and the air-minded public want something assured and explicit in the airport situation, without limiting progress.

A reasonable certainty can be attained in only one way—through sound, factual planning on a national scale. If our airport system is, at last, to be rationally planned, the first thing is to gather all the existing vital facts.

The Bureau of Air Commerce is proceeding vigorously to gather them. It is securing photographs of all airports throughout the United States, showing the exact layout of each. Then, too, the Bureau's field men, with the usual measuring instruments of engineering science, are ascertaining the actual dimensions of all the airport facilities. At major airports in different sections of the country, men armed with a battery of four synchronized motion-picture cameras just developed are making tests to determine the exact take-off and landing distance required by various types of airplanes in different atmospheric conditions and at varying altitudes above sea-level, together with the rate of climb immediately after take-off. These studies are directly related to the necessary length of runways, and their results will form a base for future airport planning.

Other aspects of this factual survey of our airports are being conducted by the Bureau of Air Commerce through the medium of questionnaires. As regards the airport's physical capacities, location, character, possibility of expansion, personnel and service, communications and meteorological data, together with all relevant facts including the landing-strips, the runways, the "aprons," the hangars, the administration buildings, the lighting, marking and identification, and obstructions on or near the field, are being recorded. These features determine the port's present classification. A wise determination of the port's proper mission will determine its future classification.

Data are being collected regarding the capital investment in airports, methods of financing, ownership, taxation, income, maintenance and operation expenditures, and interest and amortization. The Federal Government, through the Works Progress Administration, and earlier through CWA and FERA, has spent millions on municipal airports. This financial help by the Federal Government was fully justified, not only by the unemployment relief thus afforded, but by the service rendered to a new and vital form of transportation. At the same time, the main construction burden has been shouldered by the cities, as have most of the regular expenses of airport maintenance. Many persons in our cities believe this burden should be shared because of the national services which airports render and because of the interstate character of most of the traffic handled.

Comprehensive Airport Plan Needed

All these things bring us to the imperative necessity of reaching some well-reasoned, comprehensive and coherent airport plan satisfactory to all parties involved and representing a truly national airport program arrived at rationally through a complete meeting of minds among all the interests involved—the airline operators, the aircraft manufacturers, the municipalities, the Post Office Department, and the Department of Commerce.

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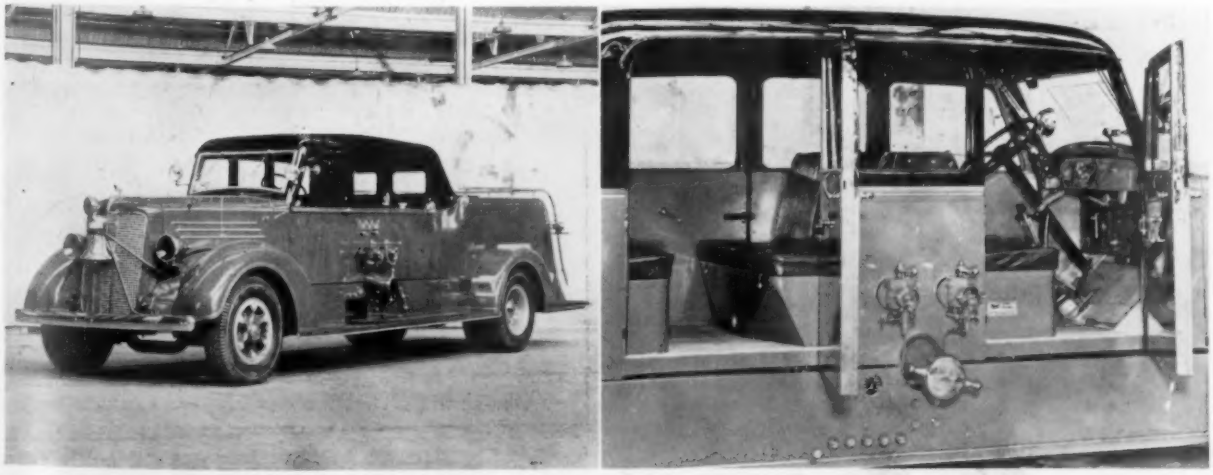

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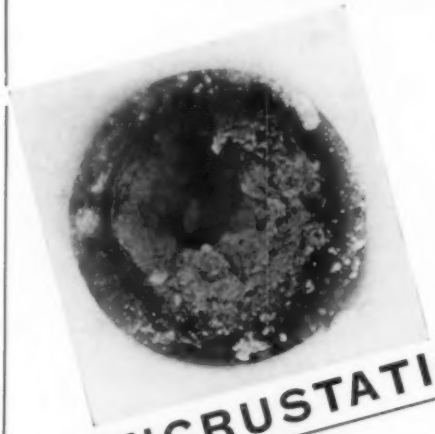

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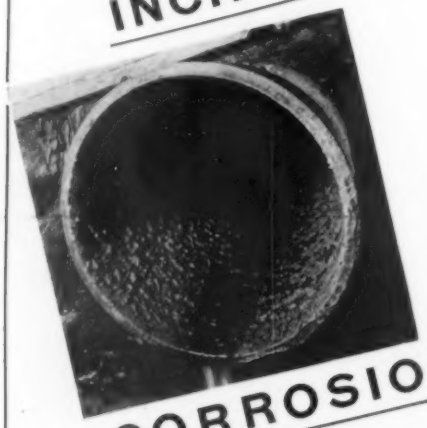

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The Consulting Engineer's Work on Incinerator Projects

By HARRISON P. EDDY, JR.
Metcalf & Eddy, Engineers, Boston, Mass.

INCINERATION is one of several methods of the disposal of municipal refuse, upon which consulting engineers occasionally are called upon for advice. This refuse consists for the most part of garbage and rubbish, the former a rather homogeneous, moist, rapidly putrescible, organic material, and the latter a heterogeneous, generally dry and much more stable material, containing much non-combustible inorganic matter. Because of the putrescible nature of the refuse, sanitation is paramount in any method of refuse disposal, and it is largely on this account that consulting engineers interested in refuse disposal have generally been sanitary engineers rather than mechanical engineers.

Frequently consulting engineers are called upon by municipal officials and municipal committees for advice as to the most feasible method of refuse disposal for their towns to adopt. Incineration is a disposal process which has an active sales force working in its behalf, and there is sometimes a call for the impartial advice of the engineer to supplement the recommendations of incinerator salesmen, and coordinate them with the needs of the municipality; also, in some cases, to advise regarding an alternative method of disposal.

The principal methods of disposal other than incineration are the feeding of garbage to hogs; the fermentation of garbage; the dumping of rubbish, together with household ashes and street cleanings; the disposal of garbage, rubbish and ashes together in the so-called "fill-and-cover" method, or sanitary fills; the disposal of garbage together with sewage solids, either by grinding and dilution in water courses as at St. Louis, digestion with sewage sludge, or incineration with sludge; reduction of garbage for the reclamation of grease, tankage and sometimes stock food; and various other miscellaneous methods. Sometimes garbage disposal by hog feeding, all considered, is the most satisfactory method for a municipality to adopt; but in such cases the problem of the disposal of rubbish and ashes still exists, as well as the problem of piggery refuse, which amounts to a substantial proportion of the weight of garbage delivered to hog farms. Sometimes, also, one of the other methods mentioned above proves to be the most satisfactory for the municipality.

Where some method of disposal other than incineration is adopted, the consulting engineer occasionally is called on to prepare plans and specifications for disposal or to lay out operating procedures in such form that the work can be carried on, sometimes by contract and sometimes by day labor, with proper regard for the sanitary features, which must be considered in every method of disposal of these organic materials.

Purchasing Incinerators

Let us trace now the developments of methods of purchasing municipal incinerators. In the earliest days of incineration, plants were usually purchased by the municipalities under guarantees of performance, but largely without specifications, and with little or no competition. Subsequently competition developed, and as the designs improved and the public demand for better municipal purchasing methods increased, specifications were presented by the incinerator dealers to the municipalities, covering the equipment offered. But with such specifications, prepared by each bidder, and containing guarantee clauses and more or less detailed statements of performance, materials and workmanship, still the bids were not strictly competitive from the point of view of the municipality, because no two dealers' specifications were on a comparable basis.

It was not until a comparatively recent date that it became common for municipalities to issue their own specifications, upon which all bidders must make their proposals. This was a long step toward fair competition, since it removed the chaos caused by bids for plants having totally different capabilities. The consulting engineer was active in this development; and the subsequent improvements which have been made in the methods of preparing specifications have been in large measure the result of the work of consulting engineers and of the Department of Sanitation in New York City.

Specifications Raise Quality

The requirement that bids be based on the same specifications also undoubtedly hastened the improvement of the products of incinerator contractors as a whole, by raising the average level of engineering standards and qualities of construction. As an example may be mentioned the simple feature of the dumping grate and ash tunnel so commonly required by municipal specifications today. In the old days, ashes were raked from the grates directly on to the firing room floor, with great clouds of steam, smoke and dust rising to the ceiling and filling the working space. The hot ashes were then shovelled into wheelbarrows, either with or without quenching with a garden hose, and pushed outdoors to a dump on the premises. This method not only made most unsatisfactory working conditions in the firing room, but frequently resulted in objectionable outdoor surroundings. By merely requiring that each bidder furnish dumping grates and an ash tunnel, with provision for discharge of ashes from the ash pits to cars and subsequent elevation to storage bins, or for direct discharge from ash pits into motor vehicles for ultimate delivery to

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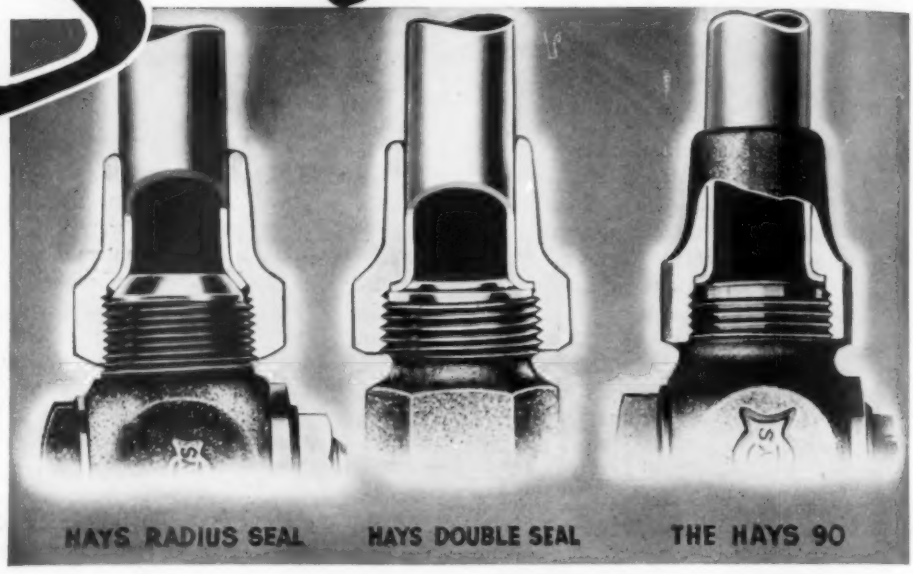

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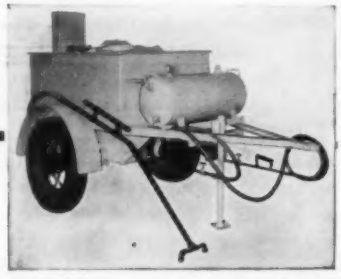

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the dump, the firing room can be made fully as cool, well-ventilated and attractive to work in as a coal-burning boiler room, and the premises can be kept as attractive as those about any public building. This simple improvement has done much to reduce objections to the building of incinerators in our cities and towns, because of the improvement in appearance of the grounds about the plant.

Similarly, numerous other improvements could be mentioned, such as crane charging, mechanical or electric-operated charging gates, the use of suspended arches, and others.

Types of Specifications

About three types of specifications are now commonly in use, in each of which the consulting engineer's influence is felt. Perhaps the most common practice is to limit the bidding to contractors who have had experience in *designing and building* incinerator plants, and the contractor makes his own designs and builds the entire plant. In such cases the municipality issues specifications for *design*, as well as for workmanship, materials and equipment; and they necessarily include guarantees.

Another type of specifications is less common. It involves the complete detailed design of building, furnaces and other equipment by the consulting engineer, or, as in the case of New York, by the city's engineers. In such cases, guarantees of furnace performance are not required because the responsibility for the design is the engineer's, not the contractor's. Bidding likewise is generally not limited to any field. A building or power plant contractor can bid as a principal on such contracts, building the entire work or subletting to incinerator or industrial furnace contractors that portion of the work if he so desires.

In between these two types of specifications is the case where the details of the plant are designed by the contractor, with bidding limited to experienced incinerator contractors, but the general architectural plans for the building are provided by the engineer, with the requirement that the details designed by the contractor shall conform to the general plans prepared by the engineer. In such cases the drawings are generally not completely dimensioned, so that any contractor may to some degree vary the dimensions to fit his equipment; but the working spaces are definitely specified, so that as nearly as possible ample room will be assured and no bidder discriminated against.

A further service which the consulting engineer renders for municipalities in connection with their incinerators is found in those occasions where he is called upon to testify in cases where residents bring injunctions to restrain the construction of incinerators in their neighborhood. With the improved standards of the various features of design and operation which are now available for municipal incinerators, such occasions should become more rare.

It seems probable that the activities of consulting engineers in the field of refuse incineration, although limited, have resulted in a definite improvement in the design of refuse incinerators and in the methods of purchasing them by our municipalities. The working conditions and methods of operation of these plants have been greatly improved, and their useful life has been lengthened.

The Tax System and Industrial Development

By GEORGE A. STEINER

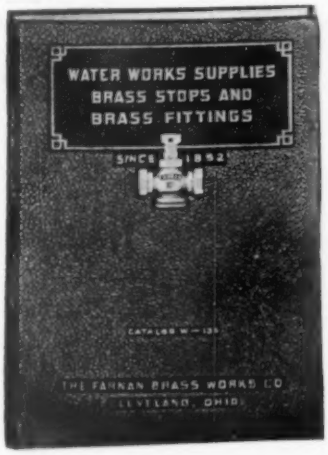
THE assertions that "heavy taxation drives manufacturing companies from a state" and that "tax-exemption attracts industry" are very old and well known. A special analysis of nine states upon the basis of their purported tax burdens, their geographical contiguity, and their industrialization, shows little correlation between the relative industrial development and the relative level of taxation in the various states in the period from 1922 to 1929. In Michigan, for example, a rapid industrial development occurred in spite of the fact that tax burdens were heavier there than in any other state. On the other hand, despite a relatively low tax burden in Pennsylvania, its industrial growth was smaller than in any other state except Minnesota and Massachusetts. The fact that there is a fair correlation between these two indexes in several of the states does not invalidate the above conclusion. Indeed, in a state in which industry is forging ahead and population is growing, as in Michigan, a growing demand for governmental functions arising from such conditions presages increasing taxation. On the other hand, "The curse of the poor is poverty." In Massachusetts, a relative decline in population and industrial activity in these years helped to enhance tax burdens. A comparison of all tests in the period from 1929 to 1935 shows that the four states in which industry declined the least, namely, Michigan, Minnesota, Massachusetts and New York, imposed heaviest taxes. Those states except Illinois which experienced the most rapid declines in these years showed relatively light taxes.

Substantially similar conclusions may be drawn regarding the indexes of manufacturing development and tax burdens upon manufacturing corporations. It appears, therefore, that heavy taxation has apparently placed little inhibition upon rapid industrial development in prosperous years. Relatively light tax burdens, on the other hand, have not proved a stimulus to the development of industry in years of prosperity. Light taxes in years of depression have not prevented extreme industrial declines, and heavy taxes have not fostered industrial depression.

In a study of thirty individual industries, chosen upon the basis of their economic importance and the volume and significance of their plant relocations among different states, the most common factors which appear to influence plant location are markets, labor and transportation. Other locational factors of importance were found to be power and fuel costs, available factory buildings, mergers and consolidations, and rents. Taxes were, on the whole, very much subordinated to other considerations.

In not one of the thirty industries examined did it appear that taxation exerted enough pressure to force plant location out of a particular state on a large scale. Moreover, no industrial movements from one state to another were noted which could be attributed solely to attractive tax features. No doubt, in the southward drift of the cotton goods industry taxation was more exertive than in any other industry examined. Its influence in this instance, however, was very much subordinated to other considerations. In industrial movements among various localities in one particular area, taxation has had some influence as a local determinant. Nevertheless, even in such cases its importance was found to be shared with other cost items, such as rents and labor.

—From a 13-page article appearing in *The Bulletin of the National Tax Association* for January, 1938, containing considerable factual material on the subject.



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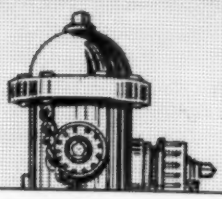

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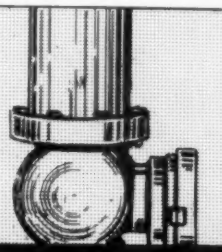

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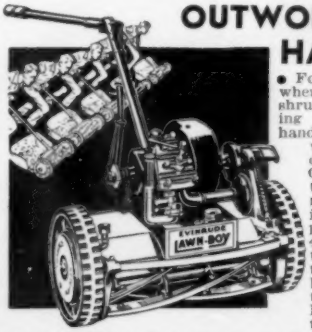

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Servicing a Sludge Digester

By DONALD E. HENN
Superintendent, DeKalb Sanitary District, DeKalb, Ill.

FOR the last year and a half it has been increasingly evident that the heating coils in the sludge digester at the DeKalb plant were coating with a cake that was insulating the coils and reducing the transfer of heat. During the winter of 1936 and 1937 the temperature in the digester dropped below efficient digesting temperatures, and it became evident that it would be unwise to attempt to face another winter season without attempting at least to return the existing heating coils to their original efficiency.

Considerable thought was given to this problem, and a plan was developed to drain and repair this unit without interfering with the operation of the plant, and to put the digester unit into service again without delay or loss of efficiency. A team and slip was hired to excavate a large shallow hole to the east of the storage tanks as a temporary sludge lagoon, the drying beds were cleaned and the two storage tanks pumped out, and on September 8 all was ready to start the work. All sludge in the digester was drawn to the storage tanks, and all water and scum to the drying beds. The digester was then pumped full of plant effluent to purge it of gas, and this water was then drawn to the drying beds, where it soon drained through the sand.

An air blower rated at 1,200 cubic feet of air a minute was set over one of the manholes of the digester to blow through a 20-inch pipe to the bottom of it. This gave a theoretical change of air every 18 minutes. This fan was started on the afternoon of September 11 and ran continuously for 40 hours before any attempt was made to enter the tank. The fan was run continuously until the work was completed.

Monday, September 13, several sparrows were trapped and lowered into the tank in a cage and left there all day without any adverse effects, and were used as an indicator of the condition of the air in the bottom of the unit.

The only unforeseen difficulty arose Monday morning, when it was discovered that one of the scum breaker arms was bent very badly. After a hurried conference, it was decided to remove both scum-breaker arms, since it was agreed that the real scum arms were in the bottom of the tank. The removal of the arms made it necessary to construct staging in the tank, cut the arms out, and then remove the staging in sections. This work required three days to complete. Thursday, September 16, the cleaning of the cake from the existing heating coils and the installation of a new coil were started. The cake on the existing coils averaged ⅝-inch thick and was made up of very definite laminate layers. No difficulty was experienced breaking this cake off the pipes, less than 8 man-hours being required to clean 380 feet of 1¼-inch pipe.

The existing heating coil in the digester consisted of three 1¼-inch pipes hung on the wall of the round tank, each pipe being 125 feet long, starting and ending in a header. A connection was made in the pipe from the return header, and one 2-inch pipe connected to it and carried around the digester and back to the return pipe to the heating unit in the office. Thus, all hot water pumped through the heating unit will circle the digester first through one of the 1¼-inch pipes and then a second time through the 2-inch pipe. It is estimated that this will increase the heating capacity by about 50 per cent. This additional heating pipe was installed for two reasons—one immediate, the other permanent. Previously, the average temperature in the digester could be raised only about 2 degrees a week in mild weather, held constant in cold weather, with a loss of temperature during the severe months of the winter. Thus it was necessary to start the winter with high digester temperatures in order to have digesting temperatures above 70° F. by spring. It was also necessary to carry high temperatures in the heating coils, which added to the caking, with the resultant loss in heat transfer.

Because it was necessary to do this work in the fall, making necessary the filling of the digester with relatively cold water late in September, it was evident that with the existing heating unit a sufficiently high temperature could not be obtained in the digester before cold weather to carry over until spring. With the additional heating coil, it was hoped the temperature could be raised more rapidly and then maintained. The second and more important reason for the addition was that much lower temperatures can now be carried in the heating coils, with the resultant reduction in caking of sludge on the heating pipes.

At 10:30 A. M. on September 17, just 9 days after work was started, the work was completed and the sludge pump started pumping seed sludge to the digester.

Refilling the Digester

During the time the digester was out of service all raw sludge was pumped to the storage tanks, which had been well seeded with sludge from the digester. When work on the digester was completed, digesting sludge from the tanks was pumped to the digester, raw sludge added to it and filled with plant effluent. The digester was full at 8 A. M. September 19, and was producing gas at the rate of 142 cubic feet per hour, which increased gradually to 384 cubic feet per hour, or 9,200 cubic feet per day, by September 23. The temperature of the sludge on September 19 was 73, the pH 6.8, and volatile matter in seed sludge 46 per cent of dry solids. The heater and circulating pump were started on September 19, and by October 2 the temperature of the sludge had been raised to 87° F., the average temperature to 84.4° F. and the pH to 7.0 without the addition of lime, and the digester had settled down to normal operation.

This rather difficult and dangerous work was completed without an accident of any kind to either man or equipment and without loss of efficiency in the plant itself. Two laborers were hired to assist the regular plant personnel of superintendent and assistant.

—Published through the courtesy of *The Digester*, a quarterly publication of the Illinois Department of Public Health.

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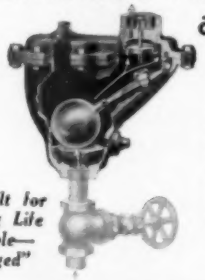

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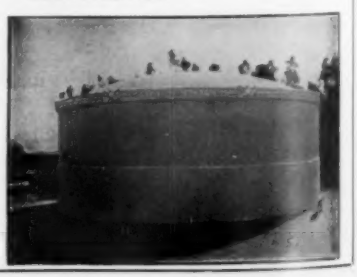

The Best Municipal Summer Sport

General Principles of Swimming-Pool Design

SINCE much of the benefit which the general public obtains from a municipally owned pool depends on proper design and coordination of the pool and its facilities, a general knowledge of swimming-pool design is of importance to municipal officials.

Unlike scholastic or private pools, which are designed to meet certain definite competitive or recreational conditions, municipal pools must be designed to provide varied facilities suitable for the maximum number of people. Separate areas for diving, swimming and wading are desirable for both recreational and safety reasons. Varying the depth of the water in a pool, while successfully separating the divers from the "splashers," will not keep swimmers out of either area unless other means of separation are used. In some pools, the diving, swimming and bathing areas are marked by floating lines, buoys or other temporary markings. A wading pool adjacent to the main pool but separated by a woven wire fence to keep small children from getting into the deeper water will prove a valuable accessory. In most installations the beach and the water are kept apart by a wire fence, and persons entering the pool area are required to pass through a shower. A broad walk entirely surrounding the pool is essential.

In many cases the persons not swimming greatly outnumber the swimmers, and a sand beach materially increases the capacity and enjoyment of the pool. Sand beaches require at least 12 inches of triple-washed sand, placed either on a concrete base equipped with floor drains or on a thick bed of gravel. Periodic raking is necessary to keep the sand free from refuse, and a solution of sodium or calcium hypochlorite or chlorine sprinkled over and washed into the sand and permitted to drain will help keep it clean and sanitary.

Shape

Round pools are usually dish-shaped, with the diving tower in the center. Rectangular pools, sometimes with central diving towers, are 3 feet at one end and as deep as 8 to 14 feet in front of the diving boards. In depths up to 5 feet the bottom should have a slope not greater than 1 foot in 15 to provide secure footing. Beyond this depth, the slope may be increased. Perpendicular walls topped with a combination drain trough and hand-rail are more desirable than sloping walls, since they increase the swimming area and permit bathers to leave the pool at any point and dive from the edges.

The drain trough, in addition to providing an overflow for the pool, should be designed to prevent surface water from the pool walks from draining into the pool. If they are not of this type, a slightly raised coping around the pool, and floor drains in the walk, should be provided.

The walls and floor of the pool must be watertight, not only to hold the water in the pool, but to prevent ground water from seeping through the walls. Concrete, for instance, should be composed of clean, well-graded aggregates and not more than 6 gallons of water per sack of cement, mixed not less than one minute and immediately placed in the forms and spaded.

Expansion joints filled with a bituminous mastic are usually placed on the perimeter of the floor where it meets the walls and on 40-foot centers across the floor. Copper seal strips placed in both construction and expansion joints prevent seepage through the joint.

Capacity

As to maximum capacity, 12 persons are usually allowed for each diving board or tower and the area within 10 feet of the end of the board; one person for each 27 square feet of the swimming area, and one person for every 10 square feet of wading area.

The maximum daily capacity or bathing load is computed from the flow of clean water into the pool. Since the quantity of dirt or foreign matter introduced into the pool is mainly dependent on the number of persons entering the pool rather than the length of time they stay in the water, the number of bathers admitted in any period of time should not exceed 20 persons for every 1,000 gallons of clean water introduced during that period.

Cleansing

Water-supply systems are of three types. The fill-and-draw and flow-through methods have generally been replaced with recirculating systems in which the water is drained from the bottom, passed through hair strainers and filters, chlorinated and pumped back into the pool. Small particles, too fine to be retained by the sand filters, are coagulated with an alum solution which covers them with a gelatinous coating, making the particles large enough to be retained by the sand filter.

While filtration will remove foreign particles and dirt from the water, it will not remove bacteria or disease organisms, and further treatment of the water is necessary. Several satisfactory types of sterilization equipment are available. The simplicity of use and testing has made some form of chlorine standard practice. In addition to

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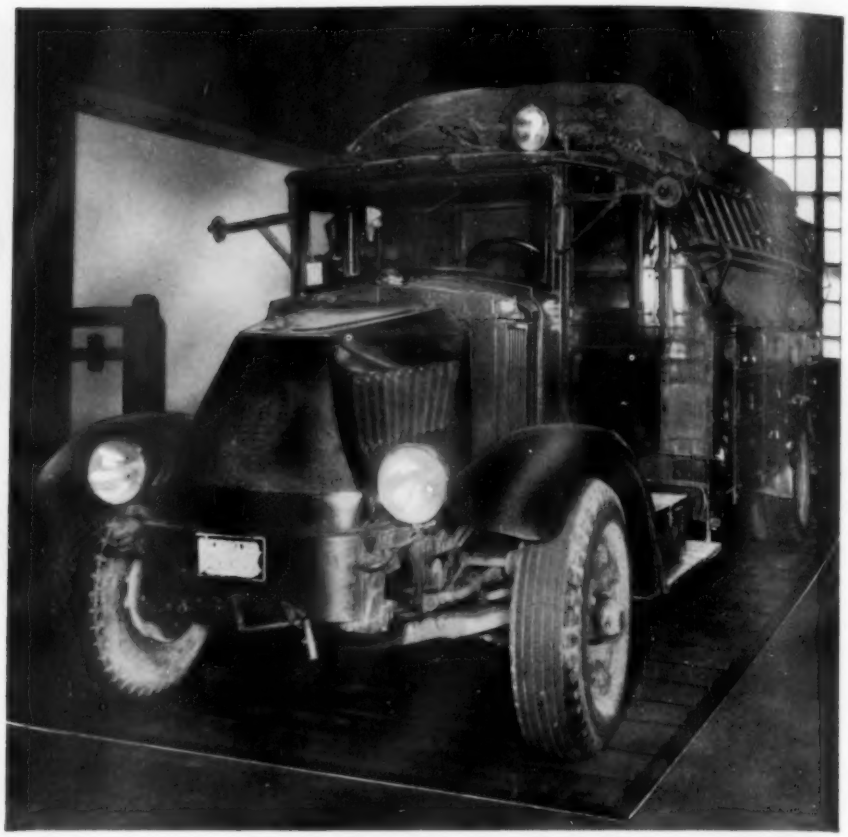

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destroying active disease organisms and bacteria, chlorine also imparts a residual sterilization power to the water which combats bacteria as soon as they are brought into the pool. Quantities of chlorine introduced into the system are regulated by daily tests conducted by a pool attendant who determines the chlorine content of the water.

Floating particles carried into the pool either by the bathers or by the wind are usually removed by raising the level of the pool and allowing the surface water to run off into the drain troughs. Outlets for the trough may lead either into the recirculating system or to the sewer. A direct connection between a swimming pool and a sanitary sewer is not advisable because of the danger of sewage being siphoned into the pool, and is prohibited in some states. Similarly, direct connections between swimming pools and drinking-water systems are also prohibited in many localities. Open surge tanks or vacuum breaks installed between the service connection and the recirculating system do not interfere with the normal functioning of the installation and prevent any possibility of contaminating the water supply.

Large or heavy particles of dirt or sand which are not carried into the floor drains are usually removed with vacuum pool cleaners. These may be operated from the sides of the pool with a long handle or from the bottom by an attendant wearing a light diving mask. Suction is provided by attaching the hose to the recirculating system or to a portable pumping unit. The resulting current acts much like the air stream in a domestic vacuum cleaner and will remove any but very large or heavy particles. Cleaning the bottom of the pool with this type of equipment once or twice a week will keep the pool bright and clean and attractive.

AT BLACK ROCK PARK, NAZARETH, PA.
In addition to this circular wading pool there is a swimming pool 100 x 50 feet, opened to the public in August, 1936

Keep Algae Away

In some localities the presence of algae, a subaqueous plant organism, constitutes a problem in outdoor pools. The most readily recognized algae are generally brown or green in color and form a coating on the sides and bottom of the pool. A second group, however, grows in a way which makes its presence more difficult to recognize. This form of algae grows on the sides of the pool, but the microscopic spores of the plant are freed as they mature, giving the water a cloudy appearance and an offensive odor and taste. Since both of these types develop on the sides of the pool, sterilization of the pool walls will aid in their control. A copper sulphate solution, scrubbed on the walls twice a year when the pool is drained for cleaning, not only kills the spores in the pores of the wall but leaves an impregnated coating that prevents the growth of algae for some time. Twenty pounds of copper sulphate per million gallons of water added to the pool will also reduce the algae problem.

SWIMMING POOL AT CROTONA PARK, THE BRONX, N. Y.
The bathhouse is brick veneer with cinder-concrete partitions and concrete structures. The New York City Park Department designed this project and built it with WPA labor

Light It at Night

Floodlights and underwater lighting systems are greatly to be desired. Floodlights should be placed back of the pool walk on poles high enough to illuminate all portions of the pool and its surrounding walks or beach. Underwater lights consisting of either neon tube or incandescent lights housed in watertight compartments in the pool walls, in addition to making night bathing as safe as daylight bathing, give the water an irridescent glow which has a strong popular appeal.

Cold Weather Uses

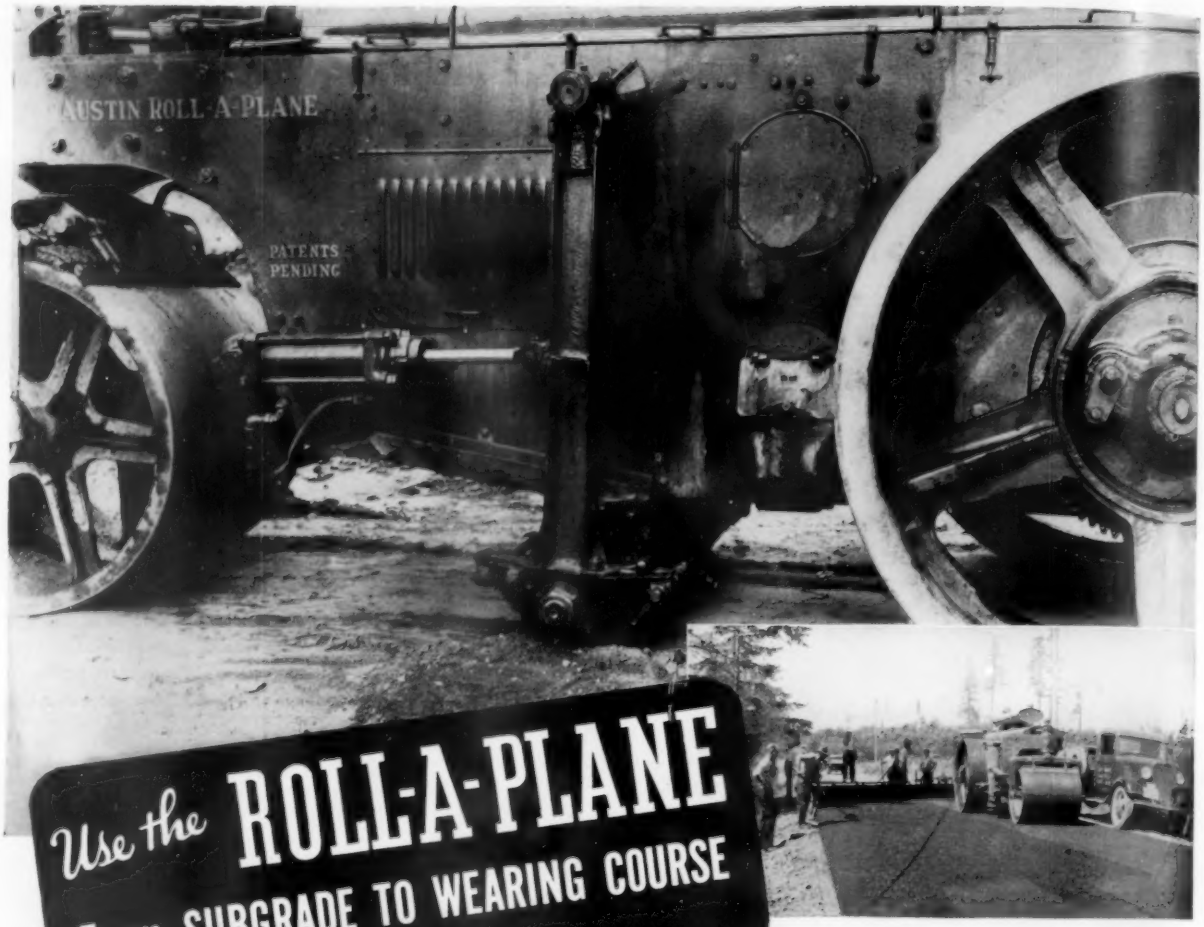
During the winter the pool may be drained or the water may be left in the pool and permitted to freeze over for ice skating. In either case the drains from the overflow trough should be kept free to prevent water from collecting and freezing in it. All other pipes and equipment should be drained and protected according to the manufacturer's recommendation.

In some pools where large areas of level bottom are available, the pool is drained between the swimming and skating seasons and the pool floor used for shuffleboard, paddle tennis and other games.

If you are interested in—

Mechanical accounting and billing—
Modern street lighting—
Successful electric-plant operation—
Modern city transportation—

Ask THE AMERICAN CITY for its special up-to-date information on these subjects.



Use the ROLL-A-PLANE From SUBGRADE TO WEARING COURSE For ROADS THAT LAST LONGER . . . CAN BE BUILT CHEAPER . . . REQUIRE LESS MAINTENANCE

● Powerful SPOT PRESSURE action—an exclusive Roll-A-Plane feature—irons out high spots and fills voids which conventional rollers miss. It prevents waviness and non-uniformity of compaction . . . cuts rolling time 30 to 50% by eliminating the necessity for cross rolling. By Roll-A-Plane-ing from subgrade to wearing course, asphaltic and other types of low cost compacted roads assure longer service with low maintenance cost, because the disintegrating impact of high speed traffic is reduced to a minimum.

Now . . . through the application of Roll-A-Plane SPOT PRESSURE action from subgrade to wearing course . . . real straight edge smooth surfaces are possible and economical. Surface variations can easily be held to less than ⅛ of an inch in ten feet. Because surface smoothness and necessary compaction are secured with a minimum of rolling, the full potential strength of the asphalt or oil is maintained while rolling costs are reduced substantially.

Write for Bulletin No. 1614 fully describing the complete line of A-W Roll-A-Planes as well as construction and maintenance economies they make possible.

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THE AUSTIN-WESTERN ROAD MACHINERY CO., 1802 Barrows St., Aurora, Ill.

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Forward Steps

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Power to Demolish "Untenanted Hazards"

NEW YORK CITY.—Under the terms of the Joseph-Fitzgerald Act of the New York Legislature, approved last month by Governor Herbert H. Lehman, the Department of Housing and Buildings of the city of New York is given power to order the demolition of a tenement house that is an "untenanted hazard," that has been vacant for 60 days, and that is not continuously guarded by a resident caretaker, or has any unsealed exterior openings, and is either a fire hazard or in a condition dangerous or detrimental to human life, health, or morals.

If the owner does not demolish an untenanted hazard within 21 days after the issuance of the order, the Department of Housing and Buildings can apply for a court order for demolition. Should the order not be obeyed within 5 days after it has been issued, the Department can order or execute the demolition of the building, and the costs of such demolition will become a lien upon the property, subordinate to any mortgages.

Passage of this legislation should speed up the removal or repair of over 2,500 derelict buildings in New York City. The dangerous waiting period after a tenement house has been vacated should be cut short. Light and air will be provided in congested areas, and the cleared spaces could be employed for parking lots, playgrounds, or other useful purposes. Children and vandals will not be attracted to these structures, and neighborhood values will not be depressed by the presence of decaying property. Owners of adjacent property should be encouraged to improve their buildings.

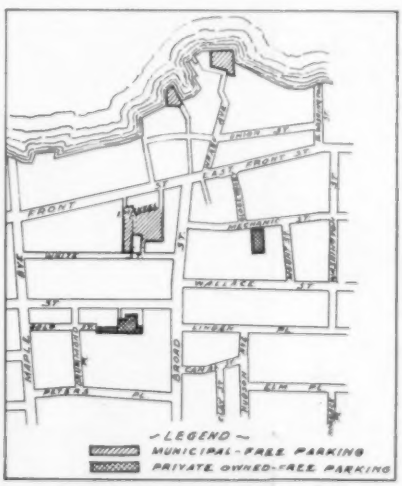
SYDNEY MASLEN,
Secretary, Committee on Housing, The Charity Organization Society of the City of New York.

Municipal Parking Areas Aid Shoppers

RED BANK, N. J.—At present it costs Red Bank $3,500 a year to provide free parking for motorists. But the improved business conditions have justified the expenditure.

Three years ago the parking problem had become so serious that the merchants came to the conclusion that something had to be done about it. As matters stood they were losing trade. Would-be shoppers coming in from neighboring communities rode round and round looking for a place to park and finally drove off to some other shopping center that was not so congested.

The situation was laid before the Chamber of Commerce, and that body arranged a meeting with the Mayor in an effort to solve the problem. From that conference came a practical solution—a strictly enforced ordinance limiting parking on the principal thoroughfares to one hour, and the creation of a free, unlimited parking area at municipal expense.



PARKING AREAS, RED BANK, N. J.

During the first year the municipal budget included an item of $1,500 to cover the leasing of a piece of vacant property adjacent to the business center. The scheme took hold at once. Word spread that parking was no longer a problem at Red Bank. The town received favorable publicity, and the merchants received increased business.

The next year the municipality refused to re-lease at a higher rental, but soon found additional space near the original lot. In order to use this space for parking, it was necessary to clear the properties of the old buildings standing on them. This clearance was another forward step in city planning, for by eliminating the old sheds and other storage places the fire hazard was reduced. At the same time the merchants were again the gainers, for this new property was directly behind many of the stores, and the fortunate ones soon cut rear entrances so that customers might enter direct from the parking lot.

Today Red Bank leases six plots on which 500 cars can be accommodated at a total municipal cost of $3,500 a year, and places this amount in the tax budget without protests from its citizens. At the principal parking lot, which accommodates 275 cars, an attendant is on duty throughout the day and until 10 P.M. on Saturdays. He watches over the cars and sees where space is available, but he is not responsible for any losses such as stolen packages or any damages to cars which might occur. His salary is paid by the merchants, who believe that his presence facilitates parking and improves the service they are seeking to render in cooperation with the municipality.

LEFT—A STREET IN RED BANK, N. J., WITH A "FREE PARKING" SIGN IN THE FOREGROUND. RIGHT—PARKING ON WHITE STREET

Modern Engineering Design *plus* the Safety of CONCRETE

Result in low accident rate on Chicago's Outer Drive

Read These Remarkable Figures!

•

One of the world's finest examples of building safety into a roadway is this section of the Outer Drive in Chicago. In four years more than 80,000,000 vehicles used this roadway, yet only two fatalities occurred; one a pedestrian and the other a driver who apparently went to sleep.

If all the roads in this country had the safety record of the Outer Drive, 30,000 lives would be saved each year!

One reason for this encouraging record is modern engineering design. Provision of 4 lanes in each direction, with a dividing parkway and with grade separations at all intersections, makes for an orderly flow of traffic.

The other reason is the pavement surface itself. This pavement is the type that the motoring public recognizes to be the safest, most uniform and reliable of all pavements —*concrete*. Concrete provides a sure grip for tires, rain or shine—a permanently true and even surface—life-saving visibility at night. So clear-cut are concrete's advantages that it outranks other materials six to one as the choice for new divided arteries such as Chicago's Outer Drive.

On 2-lane roads everywhere, as well as on multiple-lane arteries, the safety of concrete can help reduce the accident rate.

Paul G. Hoffman, president of the Studebaker Corporation and of The Automotive Safety Foundation, recently said:

"The record of Chicago's Outer Drive gives substance to the claims that the Limited Way program projected for Chicago would make 98% of the accidents which now occur on the ordinary type of roadway, a physical impossibility.

"If by some legerdemain a modernization of our important highways could be accomplished over night, thousands of lives would be saved and hundreds of thousands of accidents avoided."

PORTLAND CEMENT ASSOCIATION

Dept. A 5-4, 33 W. Grand Ave., Chicago, Ill.

A National Organization to Improve and Extend the Uses of Concrete

SAVE LIVES WITH CONCRETE

When you write for that catalog, kindly mention THE AMERICAN CITY.

Since the one-hour parking ordinance was introduced, it has been noticeable how much easier it is for a driver to find parking space adjacent to any building in which he has an errand. For those whose business will occupy more than the allotted time, the municipal parking area, free to all for an unlimited time, offers a solution. This area is open night and day, and at night is amply lighted by the municipality.

Although the White Street area is the largest, the three others are equally popular. Two of these are privately operated areas, controlled by the merchants themselves. These are under police supervision; and at strategic points throughout the business section, large, wooden, yellow hands bearing the legend "Free Parking" point toward the areas. Besides these signs, the Chamber of Commerce issues, for the convenience of motorists, maps indicating the location of the parking areas.

IDA D. CONE.

Civic Club Makes Success of Abandoned Private and Municipal Projects

SHELL LAKE, WIS.—This town of 850 inhabitants has demonstrated the possible accomplishments of a civic-minded and cooperative citizen body. In 1934, an energetic group of business and professional men banded together in the Shell Lake Civic Club for the purpose of improving their community, and their achievements in the short space of three years are worthy of note. The Club revived a number of private and municipal ventures that had failed, and applied the touchstone of success; it beautified the village and the shores of nearby Shell Lake; it has stimulated civic consciousness and pride on the part of the citizens of the community; and it has attracted people to the town and stimulated business through its various projects.

The Club first took over a closed municipal theater. Tickets were given to merchants to be given to their patrons with store purchases, which would admit them to the theater for ten cents. The admission without such tickets was twenty cents. The venture prospered. Some of the profits went into repairs, some went into a civic fund. Then the Club took over an abandoned dance pavilion, repaired it, hired the best orchestras it could get, and began staging weekly dances on Saturday nights under the supervision of business and professional men. This venture, too, has been profitable, and attracts many people to Shell Lake weekly.

The next task set for itself by the Club was the beautification of the lake shore. Hundreds of loads of dirt were hauled to fill in ugly spots, equipment was purchased for the beach, and docks and walks were built. Part of this work was set up as a WPA project, but the merchants and professional men of the town also contributed cash and work. Following this, the Club embarked on a lake drainage project and a sewage project, which are almost completed at the present time.

When financial conditions in December, 1936, forced the village itself to abandon further WPA projects, the Civic Club undertook the truck rentals and paid for materials out of the net proceeds of the operation of the dance pavilion and the theater. The project on the lake shore included 72,000 square yards of clay surfacing in the park, besides improvements to the pavilion itself. Money has also been contributed by the organization for street decorations, repairs to the dam at Fish Pond, materials and equipment for WPA recreation projects, basketball suits, flood relief, and many other useful purposes.

During the summer months the Club also sponsors free outdoor movies on the lake shore on Thursday nights. This brings hundreds of people to Shell Lake from neighboring towns.

What the Shell Lake Civic Club has done shows what could be done in almost any community where there is a civic consciousness and a cooperative spirit among its leading citizens.

LLOYD BOHN,
President, Shell Lake Civic Club.

A High-School Project in City Government

WAUKEGAN, ILL.—In 1936, and again in 1937, a project was carried out in Waukegan Township High School in which the entire senior class, over a period of three weeks, elected and appointed almost 100 of its members to take over, for one day, the administration of the city government. There is nothing new in the name of the project, for it has been done in many places, but we believe the method used here has unusual merit.

The plan was first proposed by the Mayor, and was enthusiastically endorsed by the Superintendent of Schools and the Social Studies teachers. The day the project was launched, each student was given a mimeographed sheet with the details of the plan. The students were grouped by wards, each being of approximately the same voting strength.

One week was allowed to circulate nomination petitions, and after almost a second week, the election was held, the students voting by wards. The campaigning was typical of a regular city election. The regular party lines were not allowed, but the students soon grouped themselves into such alignments as "Citizens Progressive Party," "All Women's Party," and "Student Leisure Party." Banners were placed in the front of the Senior Assembly, parades were staged, and much electioneering was carried on. In spite of the fact that the ballots were made out as non-partisan, one party polled 46 straight ballots for the four major offices; namely, mayor, city clerk, city treasurer, and police magistrate.

Approximately 75 positions were to be filled by appointment, such as police chief, fire chief, corporation counsel, superintendent of the filtration plant, and city engineer. The students were instructed to see their alderman, the mayor and other influential citizens if they wished to fill one of these places. Two days later the student mayor, the alderman, and the civics teacher met to fill the jobs. The mayor had his slate all made out, and in most cases his choices were given a majority vote by the aldermen. In a few cases his choices did not meet with the approval of the council and it was necessary to find other names.

Election Results

As soon as the election results were made known and the appointments announced, the students chosen made the acquaintance of the city officials whom they were later to impersonate by attending the regular council meeting and visiting the officials at their offices. The city officials were most interested in the project and took time to tell the students of their jobs and to take them around the city to learn at first hand the routine of city government.

One week after the election, the students filling the various positions, almost 100 in number, reported promptly at eight o'clock at the city hall, the city yards, the police and fire station, or the filtration plant, for the day's work. Students ranking high in their field spent the day at their chosen work, such as bookkeepers, stenographers, chemists, draughtsmen. The real incumbents were there, of course, but the responsibility of carrying out the work was largely placed on the shoulders of the students, and they learned in a remarkably short time the routine of the position.

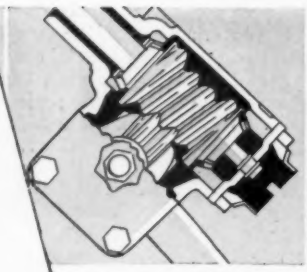
At eight o'clock in the evening of the same day, the student mayor, aldermen, city clerk, and corporation counsel held their own meeting, the council chamber overflowing with other students and interested citizens.

The mayor and aldermen had had two conferences during the day in order that they might know how they should conduct their meeting. Each alderman, as chairman of one of the standing committees, gave a carefully prepared report and made recommendations for improvements needed, such as he had discovered through his study of the city's problems. Serious discussion followed several of the reports. Because of lack of funds, most of the improvements suggested had to be deferred until some future time.

Student Reports

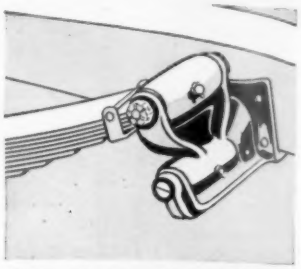
Within a few days following the taking-over of the reins of government, each student connected with the project was required to hand in a report, typed in duplicate, one copy to go to the Mayor of the city, the other to be filed with the Social Studies department for use in the new Civics course. In addition to a statement of the duties of the office filled and the activities of the student in carrying on his work, each was asked to make any suggestions for improvements in doing the job. Several worth-while improvements resulted from the suggestions. For instance, the girl in charge of the filtration plant (then seven years in operation) thought it would be quite appropriate to have a flag floating over this city institu-

A FORD TRUCK IS GREATER THAN THE SUM OF ITS PARTS



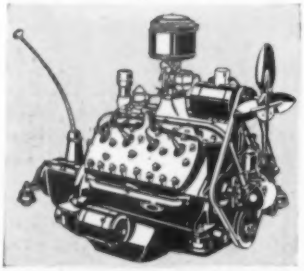
For easier driving and parking—worm and roller type steering.

Full-floating rear axle relieves the axle shafts of supporting the weight of chassis and body.



Rear springs are free-shackled at both ends. An earmark of top-quality truck construction.

—BUT LOOK AT SOME OF ITS PARTS!

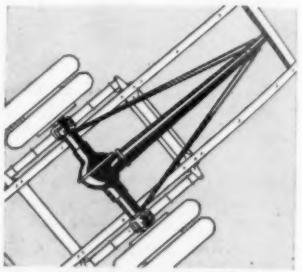


V-type 8-cylinder engine—still rolling up records for performance and economy.

Some truck buyers like to go over a unit part by part, and judge it on "points." A few of the features of the 1938 Ford V-8 Truck are shown here. Some are interesting because they are new improvements. Some are time-proved features which continue to be newsworthy because they represent the type of expensive design and construction which Ford is able to offer at low cost.

But—a Ford Truck is *greater* than the sum of all its parts. *Into* each truck goes the experience gained in 21 years of truck-building leadership. *Back* of each truck is the constant Ford ideal—to build strong, *lightweight* trucks that put MORE PAY IN EVERY PAYLOAD. And *with* each truck go the time-and-money-saving advantages of the Ford Engine and Parts Exchange Plan.

You get value *far beyond* its price when you get a Ford V-8.

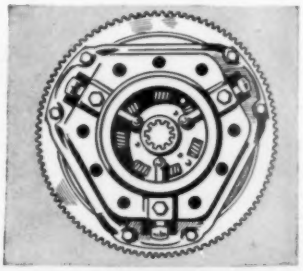


Full torque-tube drive relieves springs of driving and braking stresses.

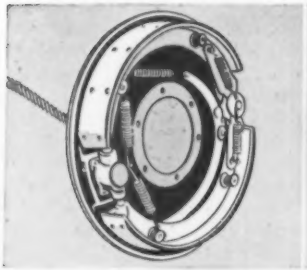
New welded all-steel cab gives extra strength, safety, comfort. 3 inches more head room.

FORD V·8

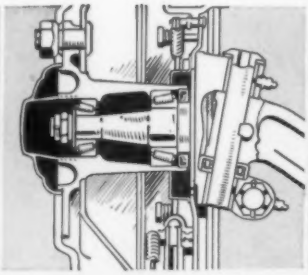
TRUCKS AND COMMERCIAL CARS



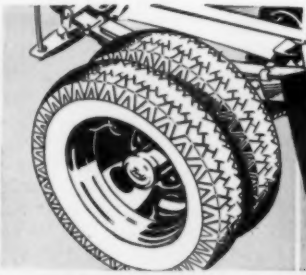
Centri-force Clutch. One of the most efficient, most reliable truck clutches ever built.



New bigger brakes—less pedal pressure—safety of steel from pedal to wheel.



Larger spindles equipped with larger spindle bolts increase the safety factor.



7.50-20 dual tire and wheel equipment is now available at slight extra cost.

ARRANGE FOR AN "ON-THE-JOB" TEST

THE PARK STADIUM AT CLINTON, IOWA, AND CLINTON'S NEW FIRE STATION

tion. Within a few weeks a flagpole was erected, and the flag has waved ever since.

The mayor, other city officials, and teachers who had helped with the project all felt that the second year represented a great advance over the first experiment. The students took their responsibilities much more seriously and seemed determined to get all the benefits possible. Printed certificates were presented to the students who participated, and the replica of the Declaration of Independence and the Constitution put out by the Sesquicentennial Commission was presented to the school by the Mayor, with the names of the student mayors engraved on it. This promises to be an annual affair, and in the long run should prove to be of inestimable value. With one hundred future leaders of the city getting this taste of the realities of city government each year, in time we should have more intelligent cooperation in assuring more efficient municipal government. The date anticipated for the 1938 repetition of the event is December 7.

MANCEL TALCOTT,
Mayor.

A Fire Station, a Stadium, and a City Hall

CLINTON, IOWA.—This city has been extraordinarily busy over the past two years with the construction of new public buildings. In March, 1937, a new central fire station was completed on the corner of 3rd Avenue South and South 4th Street. In the spring of 1937 a new stadium was finished. And it is expected that sometime during these early months of 1938 the interior of a former junior high school building will be entirely remodeled for use as a city hall.

The fire station was financed by the issuance of bonds amounting to $38,000, to be paid over a period of twenty years. It was built through direct contract. The building itself is two stories in height and is constructed of brick and concrete. In the basement are storage rooms, the battery room and the boiler room. On the first floor is the apparatus room, large enough to house three companies, a private office and a repair shop. There are six large entrances for apparatus on this floor, and the doors are electrically operated.

The second floor consists of a dormitory large enough to take care of three full companies, a reading room, two offices, an alarm equipment room, a locker room, bath and shower, kitchen and dining room, gymnasium, and a drill tower and hose tower. The dormitory has outside openings on three sides, facing east, south and west. The rooms are beautifully furnished, even to Venetian blinds.

The city is now making arrangements to place the Fire Department on the double platoon system.

The new Park Stadium was built through the medium of a WPA project, sponsored by the Park Commission of the city. It is a modern structure built of steel and concrete, with offices apart from the stadium proper. It has a seating capacity of approximately 4,000 persons. During the year 1937 the stadium was rented to the Three-Eye League for baseball purposes. It is equipped with a locker room, a dressing room, and showers for the ball players of both teams. There are built-in dugouts connected directly with the dressing room by a tunnel. The entire property is fenced with metal fencing, there is an electric score board, and all the appurtenances necessary to the playing of high-grade baseball. The diamond was constructed under the supervision of the caretaker of the Chicago Cubs baseball diamond.

The city hall project is not yet completed. It is being taken care of through WPA projects, and curtailment of Federal expenditures has slowed up the work considerably. There will be no changes on the outside of this former school building. It is substantially built of brick and contains three stories and a basement. Its original construction cost was $90,000. The inside remodeling is very extensive, and the building will eventually house all the city offices, including the Police Department.

HARRY W. COWLES,
City Clerk.

Telling the Tourist

To the Editor of THE AMERICAN CITY:

I read with interest your article on page 60 of the January number of THE AMERICAN CITY in regard to tourist traffic signs. Since my return from driving to California and north on the Pacific coast to Portland, a total of 10,300 miles, I certainly endorse your remarks on the subject of helping the tourist along the road. I have one suggestion in particular to make, and that is that all traffic number signs should bear the letter N, S, E, or W, to indicate the general direction in which one is driving. On two different occasions, on a cloudy day or at night, I became completely reversed in my direction, and when again entering my numbered road nothing on the sign indicated whether I was headed east or west, and unfortunately no citizens seemed available to help.

GEORGE L. ABELL,
Chairman, Park Commission, Wellesley, Mass.

The Municipal Bond Market

Recent sales of new issues, reported in the April issues of *The Bond Buyer*:

The Bond Buyer:

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$530,000	Wright Co., Iowa, Primary Road Refunding	1.75	4.16 Avg.	1.54
170,000	Oswego, N. Y., Home Relief and Public Works Project	1.80	1-10 Ser.	1.79
737,000	Marion Co., Ind., Advancement Fund	2.25	5.85 Avg.	2.08
165,000	Medford, Mass., Relief	2.25	5.16 Avg.	2.22
472,000	Bergen Co., N. J., General	2.25	5.33 Avg.	2.24
500,000	West Virginia, Road	2.5	12.16 Avg.	2.49
5,000,000	Roanoke, Va., Water System, General Obligations	2.75	18 Avg.	2.78
150,000	Brainerd, Minn., Sewage-Disposal Plant Revenue	3	8.16-11.5 O.-A.	2.91
144,000	Tipton, Ind., Municipal Utility Revenue	3	9 Avg.	2.92
183,500	Hammond, Ind., School City	3	13.5 Avg.	2.92
250,000	Memphis, Tenn., Improvement	2.90	1.25 Ser.	2.99
380,000	York Co., S. C., Highway	3.25	11.86 Avg.	3.22
170,000	Paterson, N. J., General Improvement			
359,000	Camden Co., N. J., Park	3.75	5.56 Avg.	3.73
100,000	Springhill, La., Public Utility Exten.	5	4.5-6.85 O.-A.	5

ARRESTS UP 54% IN BRIDGEPORT

COPS AND ROBBERS

. . . too dangerous a game for law-breakers where the police use radio—especially so when it's 2-way. With an instantaneous call and response from each radio car, you can save seconds—even minutes, when they are most valuable. If you have 1-way police radio, you can make it 2-way by *adding* transmitters in the cars and a receiver at headquarters.

. . . Since Connecticut city installed Western Electric Police Radio

● Western Electric Police Radio, installed on June 9, 1934, *covers* Bridgeport's 25 square miles. This 1-way system also transmits for Fairfield, Stratford and Westport. The 13 radio patrol cars respond to alarms in approximately 2 minutes. Speed such as this has helped make arrests jump from 1,957 the year before police radio to 3,014 this year—with approximately the same number of crimes reported. $95,000 is the estimated value of property recovered *yearly* with the aid of Western Electric Police Radio. The Fire-Chief's car and that of the Assistant Chief are radio equipped to help the Fire Department save seconds.

No matter how large or small your territory, Western Electric has the right police radio equipment to speed up your force—make it more effective. For full details on equipment to solve *your* problem—write Graybar Electric, Graybar Bldg., New York.

Distributed by Graybar

Western Electric Police Radio is giving added protection to 45,000,000 people.

Western Electric

Distributed by GRAYBAR *Electric Co. In Canada: Northern Electric Co., Ltd.*

POLICE RADIO TELEPHONE EQUIPMENT

Traffic Control and Facilitation

Conducted by Publications Committee, Institute of Traffic Engineers, 1 Park Ave., New York

Paul L. Green, Chairman; George W. Barton, Kenneth W. Mackall, Miller McClintock, Robert A. Mitchell, William R. McConochie, Arnold H. Vey, Joseph L. Wehmeyer, William A. Van Duzer, Thomas J. Seburn, Roger L. Morrison, Otto K. Jelinek, William C. Brandes

Safety Lighting Proves Itself

By **R. T. DORSEY**

Traffic Engineer, Los Angeles, Calif.

"Let there be light."

This is the cry of traffic engineers throughout the country today as accumulation of traffic accident statistics proves without question that inadequate lighting is the greatest single factor in the development of hazards involving automobiles.

Los Angeles' traffic accident death roll for February, 1938, is a striking example of this. Of 44 deaths recorded, 38 took place after nightfall. This condition becomes even more impressive when it is taken into consideration that only 30 per cent of vehicular traffic operates on our streets after dark.

The streets are the same, the people are the same, conditions in general are about the same, yet when the sun goes down, the accident rates go up.

Night itself is not necessarily hazardous, provided artificial illumination is adequate. This is proved by the fact that accidents in the center of the central retail and theater district are infrequent, owing to the additional lighting that is developed by neon and other advertising signs.

The addition of effective lighting at hazardous intersections throughout the city also brings about remarkable reductions in hazards. Checks have been made of accidents at thirteen isolated intersections where sodium-vapor luminaires have been installed. The figures show that the average sodium-vapor luminaire, properly placed, has brought a saving of more than two personal-injury accidents a year. Ten adequately lighted intersections should produce a saving of one life and 25 personal injuries a year.

Traffic accidents occur most often on main thoroughfares. Last year 29 per cent of all traffic deaths in Los Angeles occurred on twelve thoroughfares. Of the 154 deaths on these twelve streets, 116, or 75 per cent, occurred after dark.

It is calculated that if adequate lighting were provided on these streets, bringing about an equalization of night hazards with day hazards, 78 lives per year would be saved, or more than 15 per cent of the total Los Angeles automobile traffic-accident death rate.

Safety lighting fixtures are being installed now as fast as equipment is made available. During the past year, more than 80 installations have been made by the Street Traffic Engineering Bureau and the Street Lighting Department.

Approved by James E. Davis, Chief of Police, Los Angeles.

How the Safety Contest Winners Did It

THE seven first-place cities in the 1937 National Traffic Safety Contest are given below, with an inkling of how they came to be selected by these judges: Thomas H. MacDonald, Chief of the U. S. Bureau of Public Roads, Chairman; Paul G. Hoffman, President, Studebaker Corporation; D. D. Fennell, President of the National Safety Council.

At Des Plaines, Ill., population 10,000, curbs were cut back at four intersections, 53 street lights were installed, one of the 12 police officers gave all his time to traffic and the other eleven received safety instruction three hours per month, and 76 per cent of traffic arrests resulted in convictions. Outstanding enforcement took the prize, say the judges. There were no fatalities.

Everett, Wash., 31,000, had one death against three in 1936, eliminated a grade crossing, established 12 safety zones, convicted 557 out of 663 traffic offenders. The judges say the determining factor was the low fatality record, though the all-around safety program was also good.

Sacramento, Calif., 94,000, had 11 deaths against 36 in 1936, paved 16 miles of streets, installed 108 street lamps, eliminated a grade crossing, convicted 95 per cent of those arrested.

Beaumont, Texas, 58,000, tied with Sacramento, had 6 deaths, against 22 in 1936, repaved 20 miles, installed 24 safety zones, convicted half of those arrested.

Hartford, Conn., 164,000, had 14 deaths compared with 25 in 1937, eliminated four grade crossings, convicted 26 per cent. This city is also winner in its class in the Inter-Chamber of Commerce Fire Waste Contest (See Memphis).

Memphis, Tenn., 253,000, Grand Prize winner in the National Traffic Safety Contest, had 34 deaths compared with 50 in 1936 and an average of 48 for 1934-36, paved 36.3 miles of street, marked 40½ miles, inspected 95 per cent of all vehicles in the city three times. Clifford Davis, Commissioner of Public Safety, has a standing offer of $100 for anyone who can prove that a traffic ticket was fixed. Said Chairman-Judge Thomas H. MacDonald: "It was the city's comprehensive safety program and its many well-rounded and constant activities that brought it the Grand Prize." As an indication, Memphis is also grand prize winner among 300 cities participating in the Inter-Chamber of Commerce Fire Waste Contest, as announced April 1.

Milwaukee, Wis., 578,000, had 65 deaths against 70 in 1936, analyzed 260 high-accident intersections, eliminated two grade crossings, established 60 pedestrian zones, convicted 92 per cent, and has been one of America's foremost safety cities for years.

Look at It Through an Engineer

LOOK a little more closely at these four things:

1. The accident approach to traffic problems
2. Engineering remedies
3. Selective enforcement and selective education
4. A traffic engineer in every community

The first job of the engineer is to put the microscope on traffic accidents, study each report and dig out all the circumstances and contributing causes. Some of the remedies which the accident analysis indicates are traffic signs and signals; street or highway changes ranging from grade separations down to safety islands or curb radii; the fixing of one-way or through streets; the selection and marking of preferred routes for traffic; the restriction of parking. All these urgently need the engineering approach to the problem.

The engineer can be of great help in seeing that the enforcers and the public educators are provided with information on the total number and the detailed circumstances of accidents. This enables the police chief to concentrate on violations that are causing the most trouble. The engineer can also, through careful analysis of the accident record, tell both the enforcer and the educator whether their work is bearing fruit.

A growing number of cities recognize that it is worth while to have a full time traffic engineer.

SIDNEY J. WILLIAMS,
Director, Public Safety Division, National Safety Council, Chicago.

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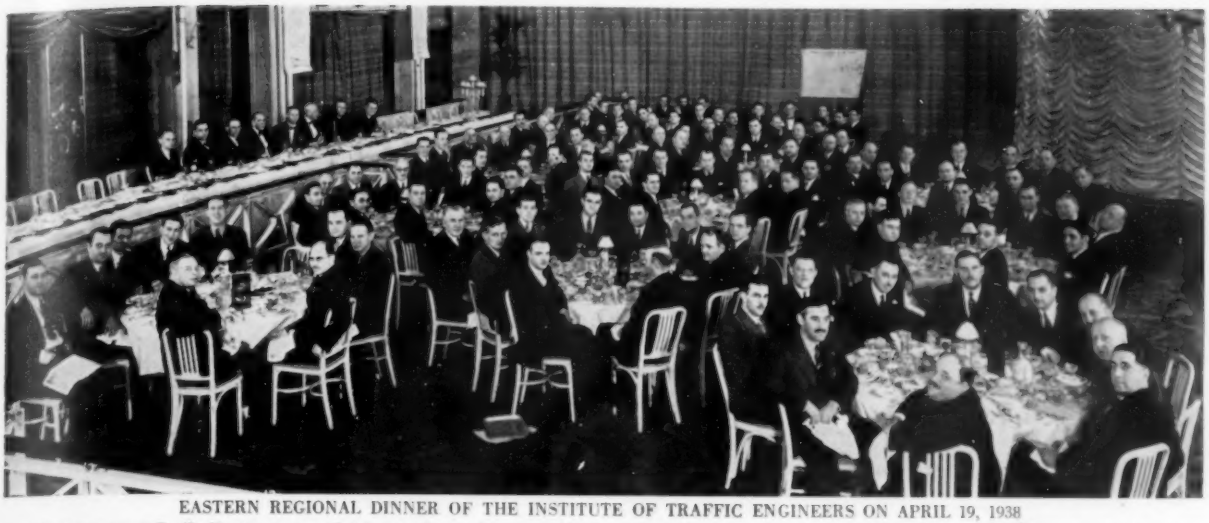

EASTERN REGIONAL DINNER OF THE INSTITUTE OF TRAFFIC ENGINEERS ON APRIL 19, 1938

The Institute of Traffic Engineers is a thriving professional group with progressive ideas, one of which, here illustrated, is the value of regional meetings. These, more frequently than annual meetings, remind various sections of the membership of the advantages of good fellowship.

Left to right on the dais are Ralph W. Eaton, Traffic Engineer, City of Providence, R. I.; W. Dent Smith, Executive Vice-President, Greater New York Safety Council, Inc.; Harry Harrison, Traffic Engineer, State of Illinois; William A. Van Duzer, Director of Vehicles and Traffic, District of Columbia, principal speaker on Traffic in the World of Tomorrow; Hawley S. Simpson, Research Engineer, American Transit Association, and Vice-President of the I. T. E.; William Phelps Eno, Chairman of the Board of the Eno Foundation for Highway Traffic Regulation, Inc., affiliated with Yale University, and Grand Old Man and Pioneer of traffic regulation; Burton W. Marsh, Director of Safety and Traffic Engineering Department, American Automobile Association; Harold F. Hammond, Manager, Traffic Division of the National Conservation Bureau, and Secretary of I. T. E.

Among those present were Miller McClintock, Yale Bureau for Street Traffic Research; W. H. Cameron, Managing Director, National Safety Council; Prof. C. J. Tilden, President, Eno Foundation, and Chairman of Transportation Committee, Yale University.

Providence Traffic Trouble Nearly Cut in Half

THE six-months traffic-safety campaign in Providence, R. I., begun December 1, 1937, and described in the March issue of THE AMERICAN CITY, has brought these remarkable monthly reductions from the corresponding month of the previous year:

	Per Cent Reduction	
	Accidents	Injuries
December, 1937.....	41.2	44.3
January, 1938.....	59.2	58.6
February, 1938.....	45.4	51.6

Below are the results for the three months December to March inclusive, compared with average figures for the same months of the previous four years:

	Per Cent Reduction
Personal injury accidents.....	48.4
Total persons injured.....	42.1
Child pedestrians.....	36.6
Adult pedestrians.....	35.6
Riders	49.2

RALPH W. EATON,
Traffic Engineer, Providence, R. I.

Near Versus Far-Side Stops

A GREAT deal of the agitation for change in stop locations originates with those who are interested in the speed of traffic flow. Usually, they advance their theories on the basis of consideration for that element alone.

Unless each element is given proper weight, one is likely to jeopardize the rights, privileges, safety, and convenience of other groups.

In my experience in dealing with accidents, which has extended over a period of more than a quarter of a century, I have found that the location of a stop many times is a contributing factor in the cause of accidents involving the mass transportation vehicle and its passengers.

With their background of experience and extended interest in the problem, transit operators are unanimous in their opinion that in general the near-side stop has many more advantages than the far-side stop.

1. Near-side stops, where they are practical, are more desirable than far-side stops.

2. Each location presents a problem of its own and must receive individual treatment.

3. There can be no arbitrary standard set up to govern all conditions.

4. The transit company should have a voice in locating all stops. Any attempt to impose arbitrary regulations will lead to many difficulties.

E. J. KREH,
Manager, Accident Prevention, Philadelphia Co., Pittsburgh, Pa.,

Near-Side Stops Preferred

ANALYSIS of data from 11 large cities reveals that the near-side stop is preferred in the majority of these cities. There are, however, few cities that do not have some far-side stops. In two of the largest, far-side stops are in the vast majority.

The following principal arguments were advanced for the near-side stop: It is felt that at certain locations, if far-side stops were made, the buses would block the cross street and obstruct the following traffic. This would be particularly likely where parking is heavy. Where there are trolley cars, far-side stops may cause pedestrian accidents by pedestrians passing around the rear of the cars. Where traffic signals or STOP signs are used, it would be necessary in many cases to make two stops if the light happened to be red when the vehicle approached the intersection. Buses may block the view of traffic signals, and at important intersections signals are sometimes placed at both near and far sides. Some feel that it is desirable for a bus or trolley to stop before crossing the intersection so that the crossing will be made at reduced speed.

T. E. TRANSEAU,
Assistant Director, Department of Public Safety, Philadelphia, Pa.

A Permanent Cure

THE Technical Committee of the Bergen County, N. J., Safety Council estimates that Route 4 accidents can be reduced 75 per cent by carrying out these three recommendations:

1. *Enforcement.*—Provide a more adequate enforcement program. Pay particular attention to the high-accident areas, high-accident hours, and worst moving violations. This should be a continuous program, well backed by the courts, in which the local, county and state police would participate.

2. *Highway Lighting.*—Install a modern highway lighting system. The importance of this is evident from the night accident rate, which is 3.7 times (on a volume basis) that of the day accident rate.

3. *Medial Strip.*—Construct a dividing island the entire length of Route 4. It does not have to be wide. Such a dividing strip down the center of the highway should have a material effect on the accidents (35 per cent) which resulted from head-on crashes.

When trees sway - lines chafe

Every time trees sway, your lines that run through them chafe and the insulation gets thinner and thinner. Then some day arcs will appear in the trees, the volt meters in your station will start to do a shimmy, and good radio reception in the neighborhood will approach the vanishing point; all this will be followed by the inevitable complaints.

These troubles can be avoided by using Simplex-FIBREX Tree Wire.

Simplex-FIBREX Tree Wire is a non-metallic, non-inductive wire especially designed for overhead lines passing through trees and subject to abrasion from swaying limbs and branches.

It has been the tree wire standard for nearly thirty years.

Recent improvements have greatly increased its abrasion resistance.

It resists abrasion almost indefinitely.

It cannot rust and will not rot.

It gives practically permanent, uninterrupted service.

We will gladly give you further information. Do you have a copy of the FIBREX Tree Wire booklet? If not, fill in the coupon below and we will send it to you promptly.

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AC 5-38

Improving Municipal Administration

Current Items from the Public Administration Clearing House

Parks Steadily Improving as Nation's Cities Stress Planning Aspects

AS thousands of parks again come into their own with the approach of summer, the best park facilities in the history of the nation will be available to the American public, the American Society of Planning Officials points out. As the result of "park consciousness" throughout the country, some 150,000 acres have been added to park systems, and previously established parks have been extensively developed and improved during recent years.

While few communities completely satisfy the standards set by planning and recreation officials for public parks provision, virtually all cities are now giving serious attention to their parks. Recent surveys show that the total park area increased from 248,627 in 1925 to 381,495 in 1935. Hundreds of cities developed and improved their parks by using work relief labor during the depression years.

At present the national average for parks is one acre for every 368 persons in the country, with cities of 250,000 to 500,000 leading in park development. The average park area in cities of this size is one acre for every 161 persons. The lowest average development is noted in cities of 5,000 to 10,000 population, where the figure is one acre to every 450 persons.

Park standards recommended by most planning officials provide for an acre of public park for each 100 population, with parks comprising approximately 10 per cent of the total area of the city. Planning and recreation organizations believe that every child should reside within a quarter of a mile of a neighborhood park and within one-half to three-fourths of a mile from a larger park.

"Park planning is a local problem subject to conditions such as transportation, topography, and population trends and density," the Society points out.

19 States Extend Tax Exemptions on Manufacturing Machinery

NINETEEN states are now granting tax concessions generally favorable to their own manufacturing plants, a survey by the National Association of Assessing Officers has disclosed. The concessions, usually extended in the form of tax exemptions on manufacturing machinery or temporary exemptions on plants and machinery, are designed to encourage the development of new industries or attract new industries to the states.

The practice of granting tax concessions spread to the South and Midwest as industry became increasingly important to these sections. Within the last decade, Florida and Virginia granted property tax immunity to manufacturing plants, and Alabama, Louisiana, Mississippi, and South Carolina broadened the scope of their immunity laws.

The special treatment accorded industries includes permanent or temporary tax exemption of manufacturing machinery in 17 states. New York exempts all personal property, including that of manufacturers, from the general property tax, while Massachusetts exempts machinery and inventories of manufacturing corporations. In Delaware no machinery is taxed, and in Pennsylvania only permanent machinery constituting real estate is placed on the tax rolls.

States granting temporary exemptions ranging from 5 to 15 years on manufacturing plants include Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Oklahoma, Rhode Island, South Carolina, Vermont, Virginia, and Wyoming.

Ohio and Kentucky place manufacturing machinery on a preferential rate classification. In Ohio such machinery is taxed on the basis of 50 per cent of its appraised valuation, while real estate pays taxes on full value. In Kentucky the tax rate is 5 mills as compared to about 30 to 35 mills on real estate.

The state of Maryland grants counties and the city of Baltimore local option on the exemption of manufacturing machinery.

Second Test Favorable for Los Angeles "Disaster Plan"

LOS ANGELES tested its "disaster preparedness" organization for the second time in five years during the recent floods and found the plan workable, the city's Efficiency Engineer, Burton L. Hunter, reports to the International City Managers' Association.

The Disaster Emergency Council was not called upon to function so completely as during the 1933 earthquake. However, coordination among the municipal, public utility, Red Cross and American Legion personnel put man-power, equipment and necessities such as food and blankets "on call" for a far greater emergency than occurred, according to Mr. Hunter, in *Public Management*, magazine of the I.C.M.A. Chief recommendations for handling future disasters were the control of radio transmission of unauthenticated rumors, and control of sightseers, many of whom lost their lives on crumbling bridges.

Disaster planning for the City and County of Los Angeles originated in 1926. It covers a metropolitan area with 3,000,000 inhabitants. Ninety-six committees are affiliated in the Disaster Emergency Council, their duties charted specifically for immediate mobilization in any crisis. Berkeley, San Diego, San Francisco, Long Beach and Pasadena are other California cities with similar plans. Louisville, Ky., Memphis, Tenn., and Binghamton, N. Y., have drawn up comparable organizations.

Lexington, Va., Becomes the 455th Council-Manager City

LEXINGTON, VA., last month became the 455th city in the United States to go under the council-manager plan, adopting it by ordinance, reports the International City Managers' Association. Lexington joins the 134 council-manager cities in the 2,500-10,000 population group. April saw four other cities voting on the council-manager plan. Beloit, Wis., with nine years' experience under the plan, and Fort Atkinson, Wis., with seven years', both voted to retain it. Fort Collins, Colo., and Grand Forks, N. Dak., found more opposition to adoption than approval when the proposal was voted on. In Grand Forks a majority of 430 voters approved adoption, but this was less than the required four-sevenths vote.

National Governmental Organizations in Chicago

The following national governmental organizations which have been located at 850 East 58th Street, Chicago, removed their headquarters last month to a new building at 1313 East 60th Street, Chicago:

American Municipal Association
American Public Welfare Association
American Public Works Association
American Society of Planning Officials
Civil Service Assembly of the United States and Canada
Council of State Governments
Federation of Tax Administrators
Governmental Research Association
International Association of Chiefs of Police
International City Managers' Association
Municipal Finance Officers' Association
National Association of Assessing Officers
National Association of Housing Officials
National Association of State Auditors, Comptrollers and Treasurers
Public Administration Clearing House
Public Administration Service

Each of these organizations is autonomous and is engaged in improving administrative techniques of government in its special field. They will continue to occupy joint headquarters to foster cooperation.

DUST PREVENTION *is the Beginning of* ROAD IMPROVEMENT

PUBLIC demand for dust prevention should not be considered unreasonable. Everybody knows that a dusty road or street is rapidly losing its surface material, that loose surfaces need binding to hold them in place and that such binding may be supplied by surface treatment with calcium chloride. When residents demand abatement of the dust nuisance, meeting that demand is real economy, if you use calcium chloride, the clean odorless dust-layer.

While gravel and stone roads are under maintenance as open surfaces, calcium chloride treatment makes the difference between success and failure, since even the best possible soil-aggregate mixture will disintegrate under traffic unless a favorable moisture content is maintained. It is best maintained with calcium chloride at such saving of material and labor, that the dustproofing really costs little or nothing.

If road funds do not permit meeting all demands for dustproofing, arrangements are frequently made for residents to pay half, or for residents to purchase the calcium chloride to be applied without cost by highway departments. In many cases of limited budgets, arrangements are made for surface application in spots where dust is particularly offensive and dangerous, such as street intersections, bridge approaches, curves and in front of dwellings. By this spot treatment method, costs may be kept at a minimum.

Where roads or streets contain proper aggregates with binder soil, maintenance with calcium chloride is the beginning of more permanent improvement. In others, yearly additions of aggregates and binder soil mixed with calcium chloride will develop well compacted stabilized wearing courses, which when maintained annually with calcium chloride, provide dustless, stable all-year roads at very low cost. Write for literature explaining these successive steps in road improvement.

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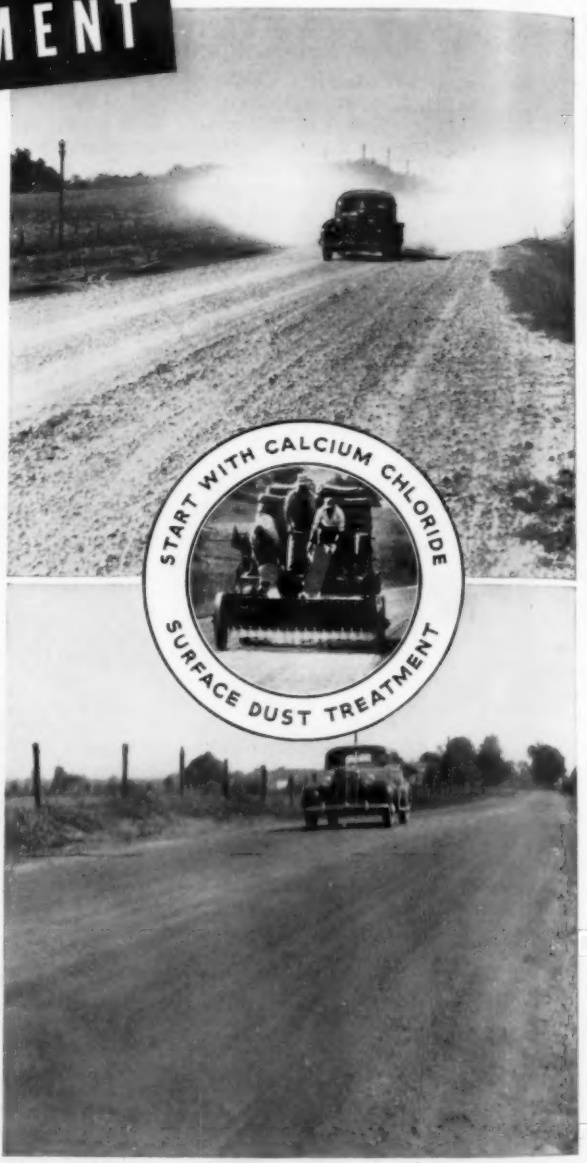

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TO IMPROVE ROADS AND STREETS

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Please send literature describing:

☐ Dustproofing ☐ Surface Consolidation ☐ Stabilized Roads

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$1,007,440,512 for 2,714 Local Projects Await PWA Funds

ANALYSIS of 2,714 locally-selected projects which have been examined and approved by the Public Works Administration, but for which no allotments have been made because of lack of available funds, reveals the fact that educational buildings top the list, with water works and sewers second.

This nation-wide survey, just reported to Administrator Harold L. Ickes by the PWA Projects Division, covers pending projects which have been approved by the PWA's Legal, Finance and Engineering Divisions. The analysis, it was pointed out, is a fair test of what the nation desires in the way of local public works, because every application was initiated by a local community itself and in every instance the local public body sponsoring the project stated that it was ready to bear 55 per cent of the cost of the project.

The estimated cost of the 2,714 projects is $1,007,440,512. Of this amount, the applicants have indicated their willingness to furnish $569,050,294, including PWA loans amounting to $132,167,500. The grant requested, amounting to $438,390,218, would represent 45 per cent of the total estimated cost under the existing law.

The number of water, sewer, garbage-disposal and power projects already examined and approved is 704, at a total estimated cost of $276,715,227, including 224 sewer-system projects, 119 sewage-disposal plants, 82 sanitary sewers and 4 combined sewers. There are also 242 projects calling for complete water works. Eighty-one of the projects are classified as electric power excluding water power, 75 for power construction, and 6 for electric distribution systems.

In the group of 1,376 building projects are 880 educational buildings, including 738 secondary school projects; 105 for colleges and universities; 13 other educational structures and 24 public libraries. Included in the list also are 193 projects for court-houses and city halls and 84 for hospitals and institutions. The total estimated cost of the buildings that it is proposed to construct would be $332,070,264, of which amount the applicants would furnish $149,812,990.

A complete and up-to-date breakdown of the 2,714 non-Federal projects examined and tentatively approved by PWA, showing the number of projects in each type, the estimated cost and the amount which the applicant has specified that it is ready to furnish, appears in the accompanying table.

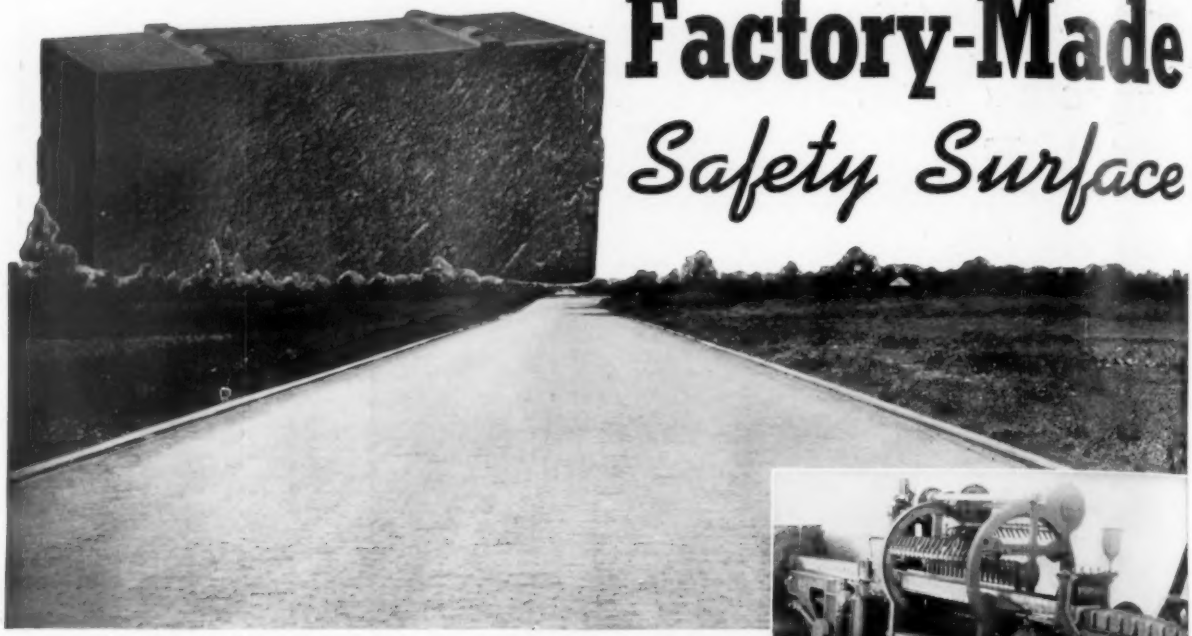
(See also page 37 of this issue)

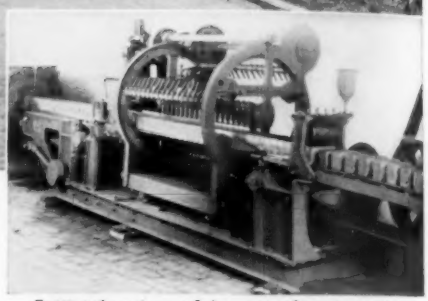
Type of Project	No. of Projs.	Estimated Cost	Funds to be Supplied By Applicants 1/
GRAND TOTAL ALL TYPES	2,714	$1,007,440,512	$436,882,794
STREETS AND HIGHWAYS	351	105,669,724	59,272,794
Roads and Highways	129	34,519,557	18,619,008
Streets	199	31,361,574	16,608,680
Grade Crossing Elimination	8	8,836,397	4,947,093
Miscellaneous	15	30,952,196	18,898,013
SEWER SYSTEMS	224	50,612,298	23,581,755
Sewage Disposal Plants	119	26,327,778	11,797,540
Sanitary Sewers	82	19,922,043	9,612,628
Storm Sewers	19	2,769,753	1,293,373
Combined Sewers	4	1,592,724	878,214
Sewer and Water	54	4,649,005	1,470,481
WATER SYSTEMS	301	77,790,797	35,519,968
Water Mains	22	4,099,373	1,112,720
Filtration Plants	14	3,129,785	1,468,733
Reservoirs	23	5,279,904	1,550,087
Complete Waterworks	242	65,281,735	31,388,428
Garbage and Rubbish Disposal	10	2,894,216	1,591,819
Gas Plants	3	97,419	20,031
Electric Power Excluding Water Power	81	120,408,511	54,541,523
Electric Distribution Systems	6	54,148,463	41,012,404
Power Construction	75	66,260,048	13,529,119
Miscellaneous	31	20,262,981	10,895,135
BUILDINGS	1,376	332,070,264	149,812,990
Educational Buildings	880	168,858,648	82,166,744
Secondary Schools	738	123,866,313	63,664,453
Colleges and Universities	105	32,430,744	11,866,917
Other Educational	13	2,853,369	1,569,353
Public Libraries	24	9,708,222	5,166,021
Municipal Auditoriums and Armories	38	$13,817,970	$7,505,888
Courthouses and City Halls	193	68,487,942	25,039,271
Hospitals and Institutions	84	32,408,874	15,539,613
Penal Institutions	43	7,080,651	3,745,285
Social, Recreational Buildings	41	7,974,668	4,275,569
Residential Buildings	1	358,000	196,900
Office and Administrative	45	9,604,011	5,259,783
Warehouses, Laboratories, Shops, etc.	14	4,465,067	2,326,788
Housing (Limited Dividend)	-	-	-
Miscellaneous	37	19,014,433	3,677,149
FLOOD CONTROL, WATER POWER AND RECLAMATION	37	54,068,992	6,339,356
Dams and Canals	10	24,491,884	2,762,137
Channel Rectification, Levees, etc.	2	667,009	366,800
Storage Reservoirs	4	4,732,687	2,147,979
Water Power Development	3	19,410,000	-
Soil Erosion	1	338,000	185,900
Flood Control	-	-	-
Miscellaneous	17	4,429,412	876,540
WATER NAVIGATION AIDS	16	12,123,268	4,602,799
Dams and Canals	-	-	-
Channel Rectification, Levees, etc.	-	-	-
Other Navigation Aids	16	12,123,268	4,602,799
ENGINEERING STRUCTURES	139	214,173,394	83,350,600
Bridges and Viaducts	109	126,091,920	64,700,846
Wharves, Piers and Docks	17	8,542,134	2,394,859
Subways and Tunnels	8	78,137,815	15,475,804
Other	5	1,401,525	779,091
AVIATION	2	270,450	148,747
RECREATIONAL	47	5,395,866	2,369,232
MISCELLANEOUS	42	6,953,327	3,365,564

1/ Does not include loans by P.W.A.

The Only Pavement with a—

Factory-Made *Safety Surface*





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SAFE..LESS COST PER YEAR OF SERVICE..COMFORTABLE

You know in advance of its construction that a brick pavement will have the highest non-skid rating.

For brick is the only pavement with a factory-made surface. Each unit is cut to a uniform coefficient of traction by automatic machines operating under constant conditions. Each brick may be inspected before it goes into the pavement. The variables and personal equation hazards of on-the-job manufacture are eliminated. Just before filler is applied, the brick are sprayed with a separating agent which permits excess filler to be completely removed. The full non-skid properties produced by wire-cutting are 100% efficient from the start.

Every possible precaution for a safe tractive surface has been met when you pave with brick. And it is much cheaper per year of service. National Paving Brick Association, National Press Building, Washington, D. C.

ADDED SAFETY FEATURES: A brick pavement is amply visible at night and restful and non-glaring by day. According to Highway Research Abstracts, in experimenting with artifical colors for other pavement types brick red has been found "most satisfactory and attractive." Traffic lanes and other safety markings are made permanent in the pavement by use of contrasting colors of brick.

BRICK

FOR NEW AND RESURFACING JOBS

During May we hope you will remember to mention THE AMERICAN CITY.

Prepared by
FRANK B. WILLIAMS
Author of "The Law of
City Planning and Zoning"

Zoning and Planning Notes

With the cooperation of
EDWARD M. BASSETT
Author of "Zoning" and of
"The Master Plan"

Zoning Regulation—Undeveloped Area

NEW YORK.—*Arverne Bay Construction Co. v. Thatcher*, 253 App. Div. 285 (February 11, 1938).—This is an action ot compel the issuance of a permit for the erection of a gasoline station. The decision of the Court is as follows:

In 1928 the city of New York constructed Linden Boulevard as an arterial highway leading from Prospect Park, Brooklyn, to Sunrise Highway in Queens County. The street is approximately 170 feet wide from property line to property line and is divided into three driveways—a central mall and two side drives separated by landscaped strips. At the time the highway was contemplated, a survey and study was made by the borough authorities as to the zoning regulations of the abutting property. Some portions, including the respondent's property, were at that time in the unrestricted area. After such study and survey, an amendment to the Building Zone Resolation, changing all the property abutting the proposed boulevard to "residential," was adopted. In 1935 the respondent applied to the Board of Standards and Appeals for a variance as to the premises involved here, upon the grounds, among others, of unnecessary hardship and practical difficulty. The application was denied. Thereafter an order was made at Special Term, sustaining an order of certiorari, annulling the determination of the Board of Standards and Appeals, and granting a variance. Upon appeal to this Court the order was reversed and the determination reinstated and confirmed. *People ex rel. Arverne Bay Construction Company v. Murdock*, 247 App. Div. 889, 286 N. Y. S. 785, affirmed without opinion, 271 N. Y. 631, 3 N. E. 2d 457. Thereupon this action was brought.

This appeal is from a judgment declaring the amended ordinance unconstitutional upon the grounds that it is an unreasonable exercise of the police power, is confiscatory, and deprives the respondent of its property without due process of law. It must be conceded, upon the undisputed facts in this case, that this property cannot, presently or in the immediate future, be profitably used for residential purposes. But the Court cannot for that reason substitute its judgment for the judgment of the zoning authority and set the ordinance aside as beyond the police power of the city legislature.

[1] This district is practically undeveloped. Such development as exists is partially conforming and partially a continuation of a non-conforming use in existence at the time the ordinance was adopted. Zoning cannot look only to the immediate present. It looks backward to protect districts already established and forward to aid the development of new districts, according to a comprehensive plan based upon a theory that what is best for the city as a whole must prevail over private interests. *Zahn v. Board of Public Works of City of Los Angeles*, 195 Cal. 497, 234 P. 388, affirmed 274 U. S. 325, 47 S. Ct. 594, 71 L.Ed. 1074.

[2, 3] The question of what is beneficial to the public welfare is a legislative question (*Matter of Wulfsohn v. Burden*, 241 N. Y. 288, 150 N. E. 120, 43 A. L. R. 651), and cannot be interfered with by the courts unless the discretion exercised "has no foundation in reason and is a mere arbitrary or irrational exercise of power having no substantial relation to the public health, the public morals, the public safety or the public welfare in its proper sense." *Nectow v. City of Cambridge*, 277 U. S. 183, 187, 48 S. Ct. 447, 72 L. Ed. 842, citing *Euclid, Ohio, v. Ambler Realty Co.*, 272 U. S. 365, 47 S. Ct. 114, 71 L. Ed. 303, 54 A. L. R. 1016. Looking at this property from the point of view of the immediate future, we might say that the regulation has no relation to public welfare, health, safety, or morals. But such a view would be narrow and provincial. If zoning boards were to take such a view, all regulations would, of necessity, be haphazard and temporary. The position of this respondent is no better nor worse than owners of property on either side of these premises for several city blocks. The boulevard is four miles long. In this particular locality, though not abutting the boulevard, there are concededly many objectionable features, but all are, of necessity, more or less temporary in character except one. All can be controlled by the action of the proper city authorities and their objectionable features ameliorated if not entirely removed. Some were in the process of being removed at the time of the trial. Public demand will compel the operation of the incinerator—the only permanent use that is at present highly objectionable—in such a manner that it will not militate against the development of this boulevard frontage for residential purposes.

[4, 5] The respondent urges that its property is worthless as restricted. It is assessed at a substantial sum and the fact that its value would be increased by removing the restriction is not controlling. *Matter of Fox Meadow Estates, Inc., v. Culley*, 233 App. Div. 250, 252 N. Y. S. 178, affirmed, 261 N. Y. 506, 185 N. E. 714. It can be admitted that the wisdom exercised by the city legislature is fairly debatable. Nevertheless, if it is fairly debatable, the regulation must be upheld. *Euclid, Ohio, v. Ambler Realty Co., supra; Town of Islip v. F. E. Summers Coal & Lumber Co.*, 257 N. Y. 167, 177 N. E. 409. This is not a case where the property was formerly used for a purpose now forbidden, such as arose in *Matter of Eaton v. Sweeny*, 257 N. Y. 176, 177 N. E. 412. This property has remained undeveloped since it ceased to be used as farm land. In my opinion the regulation will ultimately create a desirable residential community.

The action of the regulating authority indicates that it has taken a long-term view of the situation. It has looked forward to the time when the natural trend of population now residing in congested areas will turn to sections of the city so regulated that sufficient light, air space, and other essentials of normal living can be obtained.

In my opinion this regulation is designed to promote the health, welfare, safety, and morals of the entire community. Consequently, the incidental present hardship must be borne by the respondent together with other owners similarly situated. The plaintiff's pleadings and proof do not show that he has a remediable grievance. *People ex rel. Arverne Bay Construction Company v. Murdock*, supra.

Zoning—Interim Ordinance

OHIO.—*Village of Ottawa v. Odenweller Milling Co.*, 13 N. E. 2d, 144. Court of Appeals, January 9, 1936. This is an action to enjoin the erection of a grain-loading elevator.

In 1925 the Village Council passed an ordinance providing that it shall be unlawful to erect any building within the village at a cost exceeding $50 without first procuring a permit from the mayor. On July 8, 1935, the Milling Company made a written request for a building permit, which was refused. On that day at a special meeting of the Village Council, it passed an emergency ordinance making unlawful the erection of any grain elevators, grain storage house or flour mill within a certain restricted zoning area in the village. The Milling Company threatened to erect their building at the corner of Third and Oak Streets, in this restricted area, not more than 5 feet south of the south sidewalk line of Union Street. This the village claims will be a menace to public safety, convenience, peace and welfare in that the approach of trains upon the tracks of the Baltimore and Ohio Railroad will be obstructed by vehicles and persons crossing the railroad tracks at that point. The village also claims that the proposed building, being across the street and not more than 25 feet from the entrance of a fire engine house, will be a public menace by reason of the parking of vehicles which will interfere with the egress of fire engines. The village also states that it is planning to establish a city planning commission, according to law, in order to draw up a zone plan for the entire village; and that the erection of this proposed building at the site contemplated will violate the terms and conditions of the proposed zoning ordinance; and that the building at the proposed location would tend to obstruct the view of persons crossing the railroad at this point.

The restricted area is at present devoted to commercial and industrial purposes. The Court ruled that:

The ordinance, prohibiting the erection of a grain elevator in an area devoted to commercial and industrial purposes was discriminatory, unreasonable and void; and is also invalid because it endeavors to apply specific regulations to parts of the village, leaving other parts without such regulation; and considered as a stop ordinance, designed to preserve the status quo, pending the adoption of a comprehensive zoning ordinance, it is likewise invalid. Nor can the owner be deprived of his right to build at a given location because, so located, it obstructs the view of a railroad crossing. This can only be done by eminent domain.

Nor is the fact that parking cars along the curb may obstruct the passage of fire apparatus a valid objection. The village can prevent the occurrence of this danger by parking regulations, or condemning property for public use. The Milling Company, however, has failed to cover certain facts necessary to entitle them to the relief to which they were entitled under the evidence; and leave is given to amend accordingly.

Auto Junk Yards

"An auto graveyard, the existence of which violated the zoning ordinance of the city of Keene, must be removed on or before next October 15, according to a ruling handed down on April 1 by Superior Court Justice Henri A. Burque. This ruling is especially interesting in view of the auto junk yard ordinance just adopted by the citizens of the town of Greenland as a measure to help protect the land values of that community.

"On town meeting day the voters of the town of Greenland adopted an ordinance zoning the land for 1,500 feet on each side of all public highways in the town against use for auto junk yards, storage lots, or any similar use."

—*New Hampshire Planning News*, April 14, 1938.

EDITOR'S NOTE.—In regulating auto junk under a general zoning ordinance, the city of Keene seems to have adopted the better procedure.

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The City's Legal Rights and Duties

Conducted by A. L. H. STREET, Attorney at Law

Accidents

Bus passenger held not entitled to recover against city for injury received when automobile skidded into bus on account of slippery condition of street (Indiana Appellate Court: *Ewald v. City of South Bend*, 12 N. E. 2d, 995).

City held liable to public park visitor for injury sustained on defective amusement device operated for profit (Texas Supreme Court: *Scroggins v. City of Harlingen*, 112 S. W. 2d, 1035, reversing decision of Court of Civil Appeals, 101 S. W. 2d, 632).

Pedestrian held not at fault in using icy crosswalk unless there was a safer route that she could have chosen without substantial inconvenience (Minnesota Supreme Court: *Campion v. City of Rochester*, 277 N. W. 422).

City held not liable for injury to children injured while trespassing upon and demolishing a vacant private building (Illinois Appellate Court: *Trust Company of Chicago v. City of Chicago*, 13 N. E. 2d, 212).

Complaint held to state right to recover damages against municipality for death of spectator at baseball game, due to car's being driven over abutting embankment on which there was no guard-rail (South Dakota Supreme Court: *Jensen v. Juul*, 278 N. W. 6).

A 2⅝-inch offset between levels of cement squares in sidewalk held not such "insufficiency or want of repairs" as to render city liable to pedestrian who stumbled over the protruding square (Wisconsin Supreme Court: *McCormick v. City of Racine*, 277 N. W. 646).

Annexation Proceedings

Taxpayers suing to enjoin collection of municipal taxes held entitled to question validity of annexation of their property, although they had voted, platted their property, etc. (Florida Supreme Court: *Sarasota v. Skillin*, 178 So. 837).

Appointments

Under statute providing for appointment of special policeman by president *and board of trustees*, appointee by president alone held not entitled to salary after board disapproved appointment, although ordinance authorized president alone to appoint (Illinois Appellate Court: *Six v. Village of Bluffs*, 12 N. E. 2d, 926).

Bond Issues

One to whom broker unauthorizedly transferred registered bond held to have acquired title, as against city, as innocent purchaser (Kansas Supreme Court: *City of Kanopolis v. Mountain*, 76 Pac. 2d, 803).

Referendum held proper on question whether city should accept offer of Federal Government to finance city auditorium project although electors had previously approved bond issue for project (South Dakota Supreme Court: *State v. Walt*, 278 N. W. 12).

Specification of bond maturities not authorized by statute, in submitting to electors proposal to issue bonds, held to invalidate election, although it was not necessary to state the maturities proposed in submitting the question (New Mexico Supreme Court: *Mann v. City of Artesia*, 76 Pac. 2d, 941).

Business Regulations

Ordinance regulating sales of commodities in load lots held not invalid as to truckers of coal from outside the city limits because requiring unloading at city scales to get the vehicle's tare weight and reloading before delivery (Iowa Supreme Court: *Huss v. City of Creston*, 278 N. W. 196).

Civil Service

Civil service employee held not entitled to sue to enjoin abolition of his position by board on ground board was not validly created, quo warranto being the proper form of proceeding to test validity of board's creation (Mass. Supreme Judicial Court: *Brierley v. Walsh*, 12 N. E. 2d, 827).

Claims

Statutory requirement of notice to municipalities of damage claims before suit held constitutional (Indiana Supreme Court: *Sherfey v. City of Brazil*, 13 N. E. 2d, 568).

Condemnation Awards

Factors properly considered in assessing damages for land taken for municipal use stated (Minnesota Supreme Court: *Minneapolis-St. Paul Sanitary Dist. v. Fitzpatrick*, 277 N. W. 392).

Contracts

Paving contractor who consented to indefinite postponement of work could not, on later quitting, recover loss of anticipated profits on job (United States Circuit Court of Appeals, *City of Orlando v. Murphy*, 94 Fed. 2d, 426).

City held not liable to garage owner for towing and storage of cars impounded for traffic regulations, excepting as provided by ordinance covering the subject (Washington Supreme Court: *Brougham v. City of Seattle*, 76 Pac. 2d, 1013).

City employee held to have failed to prove a valid agreement by city to employ him permanently instead of making weekly payments under Workmen's Compensation Act for injuries sustained in the course of his employment (Massachusetts Supreme Judicial Court: *Conlon v. City of Lawrence*, 13 N. E. 2d, 425).

Contract of city with TVA for electric current and with PWA for a loan to construct municipal distribution plant upheld (Tennessee Supreme Court: *Memphis Power & Light Co. v. City of Memphis*, 112 S. W. 2d, 817).

Paving contract award held in substantial compliance with statutory requirements though specifications were removed from the clerk's to the engineer's office, though the advertisement for bids was not published the full time fixed by law, though the bidding specifications provided an alternative as to materials to be used, and though the successful bidder offered to furnish certain patented material after the bids were received (Wisconsin Supreme Court: *Bechthold v. City of Wauwatosa*, 277 N. W. 657).

Council Organization

That council consisted of only one member from each ward, instead of two as required by statute, held not to invalidate its acts (New Mexico Supreme Court: *Ackerman v. Baird*, 76 Pac. 2d, 947).

Election Contests

Writ to test incumbent's right to serve shortly expiring term as alderman held improperly issued at suit of citizen having no special interest in the office, even though the incumbent's title to the office was apparently defective (Minnesota Supreme Court: *State v. Fredrickson*, 277 N. W. 407).

Endowment Funds

City held to have sufficiently accepted a testamentary bequest of a fund for library purposes, by passing an ordinance establishing library, providing for trustees, etc., and not to have renounced the bequest by accepting another gift for library purposes, etc. (Wisconsin Supreme Court: *In re Mead's Estate*, 277 N. W. 694).

Food Regulations

Ordinance forbidding sale of ice cream not pasteurized and frozen on same premises within city upheld (Texas Court of Civil Appeals: *McKenna v. City of Galveston*, 113 S. W. 2d, 606).

Highways

Taxpayer held not entitled to enjoin village from expending gas tax funds to reconstruct highway on ground that highway was already sufficiently improved (Illinois Appellate Court: *Capesius v. Moulton*, 12 N. E. 2d, 911).

Licenses

Ordinance imposing $100 annual license fee on parking lots, plus $4 for each car capacity in excess of 25, held not invalid as being revenue measure nor as unjustly discriminating in favor of buildings storing cars, as to which the fee is $25 annually, plus $1 for each car capacity in excess of 25 (Illinois Supreme Court: *Stearns v. City of Chicago*, 13 N. E. 2d, 63).

Municipal Piers

City held not negligent and hence not liable where municipal pier collapsed and damaged nearby barges (United States District Court, Southern District of New York: *The B. B. No. 167*, 22 Fed. Supp. 55).

Municipal Powers

Statute empowering municipalities to lease property to manufacturers, to promote industrial welfare, etc., held not unconstitutional as lending credit to individuals, etc. (Mississippi Supreme Court: *Albritton v. City of Winona*, 178 So. 799).

Municipal Utilities

Proposal to issue bonds to construct electric plant to furnish power far in excess of local needs, for sale in other counties, held void (North Carolina Supreme Court: *Williamson v. City of High Point*, 195 S. E. 90).

Official Publications

Street improvement resolution held not vitiated by publication in semi-weekly newspaper that had been published less than four months (California Supreme Court: *Town of Yreka City v. Warrens*, 76 Pac. 2d, 688).

Official Tenure

Under a statute empowering a commission to appoint and remove a manager of a village's utilities, held that the commission could not surrender its right to remove at will by contracting for a definite term (Wisconsin Supreme Court: *Richmond v. Village of Lodi*, 277 N. W. 620).

Police Measures

Prohibition of house-to-house solicitation of magazine subscriptions by persons not having place of business in city, unless permit from police chief is obtained, upheld as means of curbing burglary and larceny (California District Court of Appeal: *Ex parte Albrecht*, 76 Pac. 2d, 713).

Poor Relief

Municipal appropriations to poor relief agencies held not covered by constitutional prohibition against appropriations to private corporations, etc. (Pennsylvania Supreme Court: *Kotch v. Middle Coal Field Poor District*, 197 Atl. 334).

Resolutions

A motion adopted by a board held not deprived of legal effect as a "resolution" because it did not embody that term nor recite, "be it resolved" (New York Court of Appeals: *Dixon v. LaGuardia*, 13 N. E. 2d, 450).

Wages

Municipal employee working more than eight hours per day, in violation of statute, held not entitled to recover pay for overtime (Arizona Supreme Court: *City of Glendale v. Dixon*, 75 Pac. 2d, 42, 683).

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The Municipal Index

Municipal Index and Atlas, 1938.—*Published by The American City Magazine Corporation, 470 Fourth Avenue, New York. Fourteenth annual edition. 667 pp.* $5.00.

In addition to the usual indispensable atlas and directory of municipal officials, The Municipal Index contains an unusually fine selection of articles and statistics in the editorial sections this year. In Section 3, Streets and Highways: Construction and Maintenance, we find street cleaning statistics for cities over 5,000 population, and articles entitled "Making a Municipal Asphalt Plant a 'Going Concern,'" "Street and Sidewalk Snow-Plowing, and Sanding Slippery Streets," and "Snow and Ice Hazards Minimized in a Vermont City." Under Water Supply and Purification are three articles entitled "pH Control in Water Purification," "Chloramines in Water Treatment," and "Activated Carbon." Sewerage and sewage-treatment statistics cover approximately 2,000 municipalities in this issue, and following the statistics is an article on "Combined Sewage-Treatment Plants and Refuse Incinerators." Under Light and Power are presented "The Case for Good Street Lighting," "Street Visibility Systems for Night Traffic Safety," "Street Lighting: a Neglected Corner of Municipal Housekeeping," and "Municipal Plants Successful in Competition." The Public Safety section covers "The Fire Department Situation in 310 Municipalities," "Parking Meters in 50 Cities," "State and Municipal Traffic Signals," "Keeping Motor Vehicles Safe," and a list of Police Chiefs and Fire Chiefs in places of over 10,000 population. The Index provides a list of municipal airports complete to January 1, 1938, and a special study of business machines entitled "Modern Office Appliances." A supplement to "A 30-Section Bookshelf for the City Hall" entitled "New Books for the City Hall Library" is provided in this issue, following up last year's list with the most useful publications appearing in the interim. The customary large selection of products and services available to municipal governments are advertised in the 1938 edition and listed for easy reference, as are the names of manufacturers and consultants.

Taxation

Tax Systems of the World.—Edited by The Tax Research Foundation. Commerce Clearing House, Inc., Chicago and New York. Seventh edition, 1938. 420 pp., 12 x 15 inches. $8.75.

In large-scale charts and tables, this useful volume gives the essential facts and data about the tax systems of the Federal Government; each of the 48 states, Alaska, Hawaii, Puerto Rico, and the District of Columbia; and more than 60 principal foreign countries. These show at a glance the base rate, collection, and administration of the various taxes levied; and cover national, state (or provincial) and local tax revenues, tax burdens as measured by ratio of taxes to national income, growth of debts and expenditures, political systems, budget systems, economic data and other pertinent facts and figures. This comprehensive work was prepared under the direction of the New York State Tax Commission with the collaboration of 300 tax authorities in this country and abroad. The facts and figures are the latest, including the new tax laws of 1937. Even "Model Tax Charts," summarizing replies by specialists in taxation and public finance to a questionnaire soliciting the essential factors in an ideal tax system, are included.

Salaries of Municipal Officials

"Salaries of Municipal Officials in Washington, 1937," is a compilation of replies from 187 Washington cities and towns in answer to a questionnaire on local salary schedules. The figures are arranged according to population to make possible a quick comparison between cities of similar size. (Apply to the Association of Washington Cities, Seattle, Wash.)

Municipal Year Book

The Municipal Year Book, 1938.—*Edited by Clarence E. Ridley and Orin F. Nolting. International City Managers' Association, 1313 East 60th Street, Chicago, Ill.* 1938. 620 *pp.* $5.00.

The fifth annual edition of this Year Book reflects the outstanding municipal developments of the year. In Part I, entitled "Municipal Administration," are articles summarizing recent activities in each of the 24 fields such as police, fire, education, public works, health; prefaced by a general picture of American cities in 1937 by Luther Gulick. Parts II, III, and IV, "Governmental Units," "Municipal Personnel," and "Municipal Finance," contain a number of new sections on "Sources of Municipal Powers," "Classes and Forms of Municipal Government," "Municipal Retirement Systems," "Organizations of Local Government Employees" and "Trends in the Cost of Local Government." The usual summary of governmental data, which has been provided in the past for all cities over 10,000 population, has been extended this year to cover the 849 municipalities between 5,000 and 10,000 population. An article on "Federal-City Relations in 1937" is particularly interesting because of the rapid developments in this relationship over the past few years. Part V of the Year Book refers readers to a large number of sources of information on municipal government, which are an invaluable supplement to the wide selection of information contained within its own pages.

The Culture of Cities

The Culture of Cities.—By Lewis Mumford. Harcourt, Brace and Co., New York. 1938. *xii* + 586 pp. $5.00 *from* The American City.

This truly philosophical analysis of the growth of the city in the colorful language of Lewis Mumford is at once refreshing, depressing and inspirational. He traces the course of urbanization from the 15th century, showing how mechanical integration has been ever shadowed by social disruption. We leapt headlong into frenzied city building with industrialization, without the remotest conception of the social meaning of such disorderliness. The devastation has finally reached such an advanced stage that we are faced with the vast task of rebuilding our entire civilization, starting with a change in the basic philosophy of man, who has become selfish and predatory rather than cooperative in his relations with his fellow beings. This volume describes the forces which brought about cities, the meaning for the future of present trends, what are the main outlines discernible of a new order, and the relation of city and region. It analyzes the possibilities of creating order and design within and around existing institutions before the destructive forces overrun our cities and destroy our new urban culture, the good with the bad. This philosophical treatise is based on facts observed at first hand by the author, and is closely bound up with real and practical problems facing the world today. "It both attempts to explore in a more unified way a field hitherto worked on divergent lines by specialists, and to establish, for the purpose of communal action, the basic principles on which our human environment—buildings, neighborhoods, cities, regions—may be renovated."

Health and Garden Cities

"Health and Garden Cities," by Norman Macfadyen, is the first of a new series of pamphlets to be published by the Garden Cities and Town Planning Association of London. It tells the story of health acquired in the English garden cities by families who formerly lived in slums, quoting supporting figures. It also makes clear the fact that no one's health is assured as long as his neighbor is living in unhealthful conditions and that the health of an entire nation should be an immediate concern of every person living therein. 11 pp. 6d. (Apply to the Garden Cities and Town Planning Association, 13 Suffolk St., Pall Mall, London, S.W.1, England.)

Community Land Planning

The Master Plan.—By Edward M. Bassett, Author of "Zoning." Published by the Russell Sage Foundation, New York. 151 pp., including index. $2.00 *from* The American City.

Mr. Bassett's host of friends and followers will rejoice that he has put in permanent and more detailed form, in this valuable little book, ideas which they have heard him expound at planning conferences.

Part I discusses the theory of legislation for *community land planning*—a term which the author adopts as more accurate for his purpose than the more common term, *city planning*. Seven community uses and markings of land areas which, according to Mr. Bassett's concept, comprise all the elements of community land planning which exist at present, are discussed. These are:

1. Streets (including pedestrian and vehicular bridges and tunnels)
2. Parks (including parkways)
3. Sites for public buildings
4. Public reservations
5. Zoning districts: any governmental unit where the regulations differ in different units
6. Routes for public utilities
7. Pierhead and bulkhead lines

Part II of the book discusses the making of a Master Plan as an important part of comprehensive city and regional planning. The author here sets down his considered advice as to what the Master Plan should and should not contain, how it differs from the Official Map, and the necessity of keeping it a plastic instrument. Brief special chapters are devoted to: Development of the term 'Master Plan"; Charter of the City of New York prior to 1938; Cincinnati, Ohio; New York Town Law, Village Law, and General City Law; The So-called Standard City Planning Enabling Act; Pennsylvania Planning Act for Second Class Cities; The California, New Jersey and Massachusetts Planning Acts; New York County Act; Pennsylvania State Planning Board Law; and the New Charter of the City of New York.

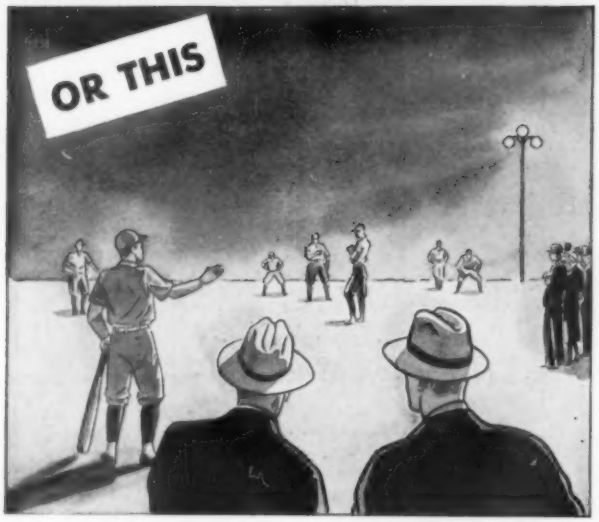
Business and Government

Business and Government.—By Charles C. Rohlfing, Edward W. Carter, Bradford W. West, of the Wharton School of Finance and Commerce, University of Pennsylvania, and John G. Hervey, Associate Dean, School of Law, Temple University. The Foundation Press, Inc., Chicago, Ill. Third edition, 1938. *xviii* + 780 *pp.* $4.00 *from* The American City.

Succeeding editions of this volume have provided a sharp indication of the rapidly increasing relations between business and government. The prolonged strain upon our political and economic institutions which we have been witnessing has given rise to powerful pressure groups based on their economic interests, which has in turn brought about considerable experimentation with economic legislation. The number of administrative boards and commissions of the Federal Government has reached 80. In this volume the many different channels of communication and regulation between government and business are analyzed for the benefit of the professional business man. Labor law, public finance, housing and farm tenancy legislation, and public utility regulation, are only a few of the subjects discussed. More than 330 illustrative court cases of significance are quoted. This text is widely used in the business schools of our colleges and universities.

Playground Regulations

A lengthy list of "Rules and Regulations of the Municipal Playgrounds" has been published by the Bureau of Parks, Recreation and Aviation of the Department of Public Works of the City of Chicago. The duties of directors and attendants are given, the use of facilities and their regulation is explained, and directions and rules for various sports, games and entire festivals are presented. 48 pp. 3c postage. (Apply to the Municipal Reference Library, 1005 City Hall, Chicago, Ill.)



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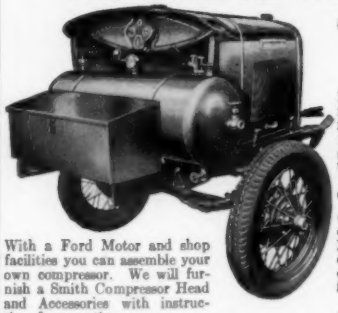

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Rural Planning

Recent Trends in Rural Planning.—By William E. Cole and Hugh P. Crowe. Prentice-Hall Co., New York. 1937. 279 *pp.* $3.50 *from* THE AMERICAN CITY.

Planning, defined as the "rearrangement and prearrangement of environment," is a subject without limit; and in fact this volume, sometimes in detail, sometimes by full reference, sometimes by bibliographical citation, covers a wide variety of subjects related to the improvement of conditions in rural districts, and is an excellent handbook for the social worker and general reader interested in late developments in this field.

In introduction to their subject, which they state to be "state, regional or national planning," the authors subdivide it into (1) "human relations planning," (2) "natural resources planning," (3) "economic planning," and (4) "governmental planning," or the planning of governmental structures, organizations and activities. Under governmental planning the recent activities and projected activities of the National Government are given the most space, much of the rest of the discussion under this head being of county and rural planning commissions.

There is a long chapter on land settlement in this country, and another on land settlement abroad. Then follows a discussion on rural social welfare generally, followed by special treatments of rural juvenile delinquency, rural crime control, rural public health, rural education, rural libraries, rural recreation, the rural church, rural government in general, and rural electrification.

Public Housing Management

Public Housing Management.—A course of lectures offered by the New York University Division of General Education in cooperation with the Municipal Civil Service Commission and the New York Housing Authority. New York University Book Store, 18 Washington Pl., New York. 1938. 254 *pp.* $2.50.

When 2,500 persons signed up to take a civil service examination in public housing management, a field in which there is as yet very little experience, an interesting opportunity for public education was offered. New York University in cooperation with the Civil Service Commission and the New York City Housing Authority organized a course of lectures shortly thereafter under the direction of Carol Aronovici and Abraham Goldfeld. A series of lectures was presented to 1,500 enthusiastic registrants, providing them with housing history and legislation and some of the best thought and practical experience available in the specialized field of housing management. The text of the 19 papers read by the experts conducting the meetings has been published in the above-named book. Each paper is a unit, respresenting the thought of its writer, and together the 19 provide a good introduction to the housing field and management in particular, even to the point of presenting the conflicting opinions that are bound to occur in so new a subject.

State and Local Fiscal Relations

"The Fiscal Aspects of State and Local Relationships in New York," by Paul E. Malone, deals with a subject of sufficient interest to have captured the financial support of the New York Tax Commission for publication. The attitude of the state government toward the local budget struggle is in the forefront today. Shall state governments share their tax collections with localities, and, if so, how? This study goes into the subject in a comprehensive manner, even considering fundamental changes in the administrative organization of local governments in the interest of solving the revenue problem. xiv + 433 pp. (Apply to the State Tax Commission, Room 523, State Office Bldg., Albany, N. Y.)

Government Researchers

In order to promote closer cooperation between those engaged in government research in Virginia in colleges and universities and official and semi-official planning and advisory agencies, "Who's Who in Public Administration Research in Virginia" has been recently compiled by Rowland Egger, Raymond Uhl and Vincent Shea, of the Bureau of Public Administration, University of Virginia. This directory will be kept up to date by the issuance of frequent supplements and consolidated indices. 67 pp. (Apply to the Bureau of Public Administration, University, Va.)

Who's Who in New York

Who's Who in New York (City and State) in 1938.—Edited by Winfield Scott Downs. Lewis Historical Publishing Co., New York. Tenth Edition. xviii + 1,325 pp. $10.00 *from* THE AMERICAN CITY.

This "Biography in Dictionary Form of the Leaders in All Phases of Life in the Metropolis and the Commonwealth" is announced in its latest edition as "a picture of the city and state as they have emerged from depression years." This record of new and surviving leadership during the past ten years in New York is indicative of the shifts in values that have occurred during that time. An unbiased editorial policy of selection of names for inclusion has been conscientiously maintained to give this volume real merit as a reference work.

Municipal Abattoirs

"Municipal Abattoirs and Private Slaughterhouses: A Factual Study of the Cost and Operation of 32 City-Owned Abattoirs and Methods of Control over Private Slaughterhouses," is a joint study by the American Municipal Association and the International City Managers' Association. Since Federal meat inspection laws cover only those products which are in interstate and foreign commerce, 30 per cent of the meat consumed in this country is not Federally inspected. Where this is the case, the setting of standards and regulations is left to the state and local governments, and they are often inadequate and not enforced. This is a factual study of these regulations covering every municipality in the United States that could be found owning and operating an abattoir. It contains no recommendations. 41 pp. (Apply to the American Municipal Assn., 1313 E. 60th St., Chicago, Ill.)

Can America Build Houses?

The Public Affairs Committee of New York has published "Can America Build Houses?" by Miles Colean as number 19 in its series of educational pamphlets. It is a clear and straightforward presentation of the housing problem, its underlying determinants and the history to date of measures to meet it. The housing problem is emphasized here as primarily a local problem, and in the final section of the pamphlet an outline of approach is given for the local community. The removal of certain legal obstacles to home building, the establishment of rational building codes, zoning and land-planning regulations, action of the building industry to reorganize itself, and the continuance of Federal and state aid to ameliorate serious conditions, are strongly recommended. 31 pp. 10c. (Apply to Public Affairs Committee, Inc., 8 W. 40th St., New York.)

Conditional Sales Contracts

"Conditional Sales Contracts in Municipal Purchases—Some Legal Aspects of Financing Such Self-Liquidating Activities" has just been issued as Report No. 122 of the American Municipal Association. The practice of purchasing certain heavy machinery and supplies under conditional sales contracts has been resorted to increasingly by municipalities in recent years. Title remains in the vendor until the payments, which are made from the revenue produced through such purchases, are complete. Often legal questions arise in relation to this type of purchase, and it is such aspects that are summarized in this publication. 12 pp. 50c. (Apply to the American Municipal Association, 1313 E. 60th St., Chicago, Ill.)

Traffic

"1937 Proceedings, Institute of Traffic Engineers" contains a collection of papers by those in touch with the latest developments of this rapidly growing and changing profession. The first few indicate the function and set-up of the traffic engineer and his department in the modern state, county and city. The following papers deal with parking meters, highway safety engineering, bypass routes, pedestrian protection, reckless drivers, traffic planning, grade crossings, safety promotion and a number of other topics. This wide selection of subjects covers the latest thought in the field and should be of considerable interest to traffic-minded citizens and officials. 126 pp. $1.00. (Apply to the Institute of Traffic Engineers, 60 John St., New York.)

Water-Works Ownership

The Burns and McDonnell Engineering Co. has been engaged in water-works engineering practice for many years, principally in the service of municipalities. Therefore its new pamphlet, "Water-works Ownership in the United States," is particularly interesting and authoritative. It contains, first of all, the results of a nation-wide survey on water property ownership which discloses that 84 per cent of the population in cities of 3,000 and more is now served by publicly owned water utilities. The trend is increasingly toward municipal ownership and, according to this booklet, for valid reasons. It is maintained that the city can render more efficient and economical service, and that only through municipal ownership can rates be effectively regulated. At the present time conditions for acquisition of water-works properties are most favorable, and an acquisition plan is outlined herein. (Apply to Burns & McDonnell Engineering Co., 107 W. Linwood Blvd., Kansas City, Mo.)

Police and Firemen's Pensions

According to a publication of the Buffalo Municipal Research Bureau entitled "Police and Firemen's Pension Funds of the City of Buffalo, New York," these pension funds are antiquated in character and not on a sound financial basis. This study demonstrates that the cost of maintaining the funds has mounted annually, and recommends that they be replaced by a modern system which will be less costly to the taxpayers and give greater security to prospective beneficiaries. The Bureau's inquiry into the police and firemen's pension funds was originally made in 1933, but the statistical information has been brought up to date a second time in this 1938 edition. 24 pp. 35c. (Apply to the Buffalo Municipal Research Bureau, Inc., 323 White Bldg., Buffalo, N. Y.)

Licensing Skill Games

"Licensing of Skill Games and Vending Machines in Washington Municipalities" is a short paper on the nature of regulations of these games, including a list of the fees charged by 79 Washington cities, and 3 representative ordinances. Licenses make it possible for the municipality to keep a check on the location and number of these devices in addition to bringing in a considerable amount of revenue. The fee ranges from 50 cents to $28 per machine per month. This bulletin should be useful to any city council contemplating the establishment or revision of a license schedule. (Apply to the Association of Washington Cities, Commerce Hall, University of Washington, Seattle, Wash.)

Indiana Centralization

"A Summary of Indiana Centralization" is further described as "A Monograph Supported by Tables Showing Contributions to and Allocations from Principal State Revenue Funds by the Counties of Indiana (1935)." A great deal of attention has been paid recently to the increase in state tax collections which are locally shared. This paper presents statistical material showing the extent of this practice in Indiana. 20 pp. 25c. (Apply to the Bureau of Governmental Research, Indiana University, Bloomington, Ind.)

Other Reports Received

ALBANY, N. Y.—"Progress, The Port of Albany."

ALLIANCE, NEBR.—Annual Report, 1937. 48 pp.

CHICAGO, ILL.—Report of the Department of Law, 1937. 71 pp.

CHICAGO, ILL.—Revised Uniform Traffic Code. 48 pp.

HENNEPIN COUNTY, MINN.—Financial Statement, 1937. 44 pp.

LARCHMONT, N. Y.—Annual Report, 1937-8. 36 pp.

MARQUETTE, MICH.—Reports, 1937.

MICHIGAN CITIES.—Assessed Valuations, Tax Rates, Levies and Collections 1937. Michigan Municipal League, Ann Arbor, Mich.

SUFFOLK COUNTY, N. Y.—Report, Mosquito Extermination Commission, 1937. 40 pp.

TOPEKA, KANS.—Annual Report, Department of Finance and Revenue, 1937. 81 pp.

WASHINGTON CITIES.—"Selected Municipal Occupation Taxes." Association of Washington Cities, Seattle, Wash. 12 pp.

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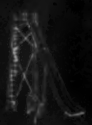

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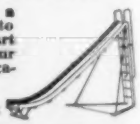

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Conventions -- When and Where

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

Meeting is annual convention unless otherwise designated

MAY 9-12.—ATLANTIC CITY, N. J.
National Fire Protection Association. (Haddon Hall.) M'ng Dir., Franklin H. Wentworth, 60 Batterymarch St., Boston, Mass.

MAY 9.—DANBURY, CONN.
New England Sewage Works Association. (Hotel Green.) Sec., F. W. Gilcreas, State Dept. of Health, Albany, N. Y.

MAY 13-14.—BOZEMAN, MONT.
American Water Works Association—Montana Section. (Baxter Hotel.) Sec., Herbert B. Foote, State Dept. of Health, Helena, Mont.

MAY 17-19.—CHICAGO, ILL.
Midwest Safety Conference. Mgr., George C. Traver, 222 N. Bank Drive, Chicago, Ill.

MAY 18-21.—WILKES-BARRE, PA.
Pennsylvania State Association of Township Commissioners. (Sterling Hotel.) Sec-Treas., H. A. Fritschman, Eagle and Darby Rds., Upper Darby, Pa.

MAY 19-21.—SPOKANE, WASH.
American Water Works Association — Pacific Northwest Section. (Davenport Hotel.) Sec., Fred Merryfield, Oregon State College, Corvallis, Ore.

MAY 19-20.—BALTIMORE, MD.
Maryland-Delaware Water and Sewerage Association. (Emerson Hotel.) Sec., A. W. Blohm, 2411 N. Charles St., Baltimore, Md.

MAY 23-25.—DAYTONA BEACH, FLA.
American Water Works Association—Florida Section. (Williams Hotel.) Sec., J. R. Hoy, 404 Hildebrandt Bldg., Jacksonville, Fla.

MAY 24-27.—NASHVILLE, TENN.
Smoke Prevention Association. (Andrew Jackson Hotel.) Sec., Frank A. Chambers, 1411 City Hall Square Bldg., Chicago, Ill.

MAY 25.—RIDGEWOOD, N. J.
American Water Works Association—New Jersey Section. Sec.-Treas., H. N. Lendall, College of Engineering, Rutgers Univ., New Brunswick, N. J.

MAY 26-28.—ROCK ISLAND, ILL.
National County Officers' Association. (Armory.) Pres., George F. Breitbach, Court House, Milwaukee, Wis.

JUNE 3-4.—BUFFALO, N. Y.
New York State Sewage Works Association. (Hotel Lafayette.) Sec.-Treas., A. S. Bedell, State Dept. of Health, Albany, N. Y.

JUNE 7-8.—ATLANTIC CITY, N. J.
Edison Electric Institute. M'ng Dir., Bernard F. Weadock, 420 Lexington Ave., New York.

JUNE 7-9.—STATE COLLEGE, PA.
Pennsylvania Water Works Operators' Association. (College Buildings.) Sec.-Treas., I. M. Glace, 22 S. 22d St., Harrisburg, Pa.

JUNE 8-10.—ELMIRA, N. Y.
Conference of Mayors and Other Municipal Officials of the State of New York. (Mark Twain Hotel.) Exec. Sec., William P. Capes, City Hall, Albany, N. Y.

JUNE 8-10.—STATE COLLEGE, PA.
Pennsylvania Sewage Works Association. (College Hotel-Nittany Lion.) Sec., L. D. Matter, Kirby Health Center, Wilkes-Barre, Pa.

JUNE 15-16.—BLOOMINGTON, ILL.
Illinois Association of Sanitary Districts. (Illinois Hotel.) Sec.-Treas., Earl R. DePew, 304 Unity Bldg., Bloomington, Ill.

JUNE 15-16.—MITCHELL, S. DAK.
League of South Dakota Municipalities. (Widmann Hotel.) Sec., Dr. G. R. Breckenridge, Univ. of South Dakota, Vermilion, S. Dak.

JUNE 16-18.—BALTIMORE, MD.
Eastern Association of Fire Chiefs. (Lord Baltimore Hotel.) Sec., Charles E. Clark, Box 217, Wayne, Pa.

JUNE 20-24.—WASHINGTON, D. C.
American Institute of Electrical Engineers. (Mayflower Hotel.) Nat'l Sec., H. H. Henline, 33 W. 39th St., New York.

JUNE 20-22.—MINNEAPOLIS, MINN.
National Conference on Planning. (Nicollet Hotel.) Joint annual conference of American Planning and Civic Association, American Society of Planning Officials and American City Planning Institute. Exec. Dir., Walter H. Blucher, American Society of Planning Officials, 1313 E. 60th St., Chicago, Ill.

JUNE 20-22.—HALIFAX, NOVA SCOTIA.
Canadian Public Health Association. Gen. Sec., Dr. J. T. Phair, Spadina House, Toronto, Ont.

JUNE 20-22.—ERIE, PA.
Pennsylvania State Association of Boroughs. Pres., Thomas F. Chrostwaite, Hanover, Pa.

JUNE 21-23.—BURLINGTON, VT.
New England Association of Fire Chiefs. (Hotel Vermont.) Sec., John W. O'Hearn, Watertown, Mass.

JUNE 26 - JULY 2.—SEATTLE, WASH.
Joint meeting. (Olympic Hotel.) *American Public Welfare Association.* Dir., Fred K. Hoehler, 1313 E. 60th St., Chicago, Ill. *National Conference on Social Work.* Gen. Sec., Howard R. Knight, 82 N. High St., Columbus, Ohio.

JUNE 26-30.—NEW YORK CITY.
National Education Association of the United States. (Pennsylvania Hotel.) Sec., Willard E. Givens, 1201 16th St., N. W., Washington, D. C.

JULY 25-28.—ALLENTOWN, PA.
Pennsylvania Chiefs of Police Association. Sec., F. B. Titus, Lansdowne, Pa.

AUGUST 13-20.—MEXICO CITY.
International Federation for Housing and Town Planning. Congress. Gen. Sec., Donald C. L. Murray, rue Cantersteen 47, Shell Bldg. 608, Brussels, Belgium. Mexican rep., Carlos Contreras, Ramos Arizpe No. 1, Mexico, D. F.

AUGUST 14-20.—EVANSTON, ILL.
National Institute for Commercial and Trade Organization Executives. (Northwestern Univ.) Sec., C. R. Miles, 836 First Nat'l Bank Bldg., Chicago, Ill.

AUGUST 15-18. ST. PAUL, MINN.
Municipal Finance Officers' Association of the United States and Canada. (Hotel Lowry.) Exec. Dir., Carl H. Chatters, 1313 E. 60th St., Chicago, Ill.

AUGUST 29 - SEPTEMBER 1.—MINNEAPOLIS, MINN.
Illuminating Engineering Society. (Nicollet Hotel.) Gen. Sec., A. D. Cameron, 51 Madison Ave., New York.

AUGUST 29 - SEPTEMBER 3.—ATLANTA, GA.
International Association of Fire Fighters. (Atlanta Biltmore Hotel.) Sec.-Treas., George J. Richardson, A. F. of L. Building, Washington, D. C.

AUGUST 31 - SEPTEMBER 2.—ST. LOUIS, MO.
National Shade Tree Conference. (Coronado Hotel.) Sec.-Treas., L. C. Chadwick, Ohio State Univ., Columbus, Ohio.

SEPTEMBER 5-8.—TORONTO, ONT.
International Association of Chiefs of Police. (Royal York Hotel.) Exec. Vice-Pres., William P. Rutledge, 1313 E. 60th St., Chicago, Ill.

SEPTEMBER 7-10.—PRINCETON, N. J.
Governmental Research Association. (Princeton Inn.) Sec.-Treas., Robert M. Paige, 1313 E. 60th St., Chicago, Ill.

SEPTEMBER 8-10.—VALLEY CITY, N. DAK.
League of North Dakota Municipalities. (Rudolph Hotel.) Exec. Sec., Myron H. Atkinson, City Auditor, Bismarck, N. Dak.

SEPTEMBER 12-13.—CASPER, WYO.
American Water Works Association — Rocky Mountain Section. (Townsend Hotel.) Sec.-Treas., B. V. Howe, 437 State Office Bldg., Denver, Colo.

SEPTEMBER 12-15.—BALTIMORE, MD.
International Municipal Signal Association, Inc. (Lord Baltimore Hotel.) Sec., Irvin Shulsinger, 7 E. 42d St., New York.

SEPTEMBER 13-16.—BOSTON, MASS.
New England Water Works Association. (Hotel Statler.) Sec., Frank J. Gifford, 613 Statler Bldg., Boston, Mass.

SEPTEMBER 14-15.—ROCKFORD, ILL.
Illinois Municipal League. (Hotel Faust.) Sec., A. D. McLarty, 500 E. Capitol Ave., Springfield, Ill.

SEPTEMBER 18-22.—MILWAUKEE, WIS.
American Institute of Park Executives. Exec. Sec., Will O. Doolittle, Box 422, Tulsa, Okla.

SEPTEMBER 19-22.—ATLANTIC CITY, N. J.
American Transit Association. (Atlantic City Auditorium.) Gen. Sec., Guy C. Hecker, 292 Madison Ave., New York.

SEPTEMBER 19-22.—SANTA BARBARA, CALIF.
League of California Municipalities. Sec., Richard Graves, City Hall, San Francisco, Calif.

SEPTEMBER 22-23.—POUGHKEEPSIE, N. Y.
American Water Works Association—New York Section. (Nelson House.) Sec.-Treas., R. K. Blanchard, 50 W. 50th St., New York.

SEPTEMBER 26-29.—BOSTON, MASS.
International City Managers' Association. (Hotel Statler.) Exec. Dir., Clarence E. Ridley, 1313 E. 60th St., Chicago, Ill.

SEPTEMBER 26-28.—MANHATTAN, KANS.
League of Kansas Municipalities. (Hotel Wareham.) Exec. Sec., John G. Stutz, Lawrence, Kans.

SEPTEMBER 29 - OCTOBER 1.—MINNEAPOLIS, MINN.
American Water Works Association—Minnesota Section. Sec.-Treas., Ronald M. Finch, Wallace & Tiernan Co., Inc., 414 Flour Exchange, Minneapolis, Minn.

OCTOBER 3-5.—NEW YORK CITY.
American Public Works Association. Exec. Dir., F. W. Herring, 1313 E. 60th St., Chicago.

OCTOBER 3-7.—PITTSBURGH, PA.
National Recreation Association. (William Penn Hotel.) Administrative Sec., Thomas E. Rivers, 315 Fourth Ave., New York.

OCTOBER 5-7.—CHICAGO, ILL.
American Municipal Association. Exec. Sec., Clifford W. Ham, 1313 E. 60th St., Chicago, Ill.

OCTOBER 6-7.—WASHINGTON, D. C.
American Water Works Association — Four States Section. Sec.-Treas., Carl A. Hechmer, Washington Suburban Sanitary Dist., Hyattsville, Md.

OCTOBER 6-8.—HARTFORD, CONN.
Joint meeting. (Hotel Bond.) *New England Sewage Works Association.* Sec., F. W. Gilcreas, State Dept. of Health, Albany, N. Y. *New York State Sewage Works Association.* Sec.-Treas., A. S Bedell, State Dept. of Health, Albany, N. Y.

OCTOBER 10-14.—CHICAGO, ILL.
National Association of Public School Business Officials. (Palmer House.) Sec., H. W. Cramblet, Board of Education, Pittsburgh, Pa.

OCTOBER 10-14.—CHICAGO, ILL.
National Safety Council. (Stevens Hotel.) M'ng Dir., 20 N. Wacker Drive, Chicago, Ill.

OCTOBER 12-14.—KEARNEY, NEBR.
League of Nebraska Municipalities. (Fort Kearney Hotel.) Sec.-Treas., C. E. Beals, 204 Brownell Bldg., Lincoln, Nebr.

OCTOBER 13-15.—DES MOINES, IOWA.
American Water Works Association—Missouri Valley Section. (Fort Des Moines Hotel.) Sec., Earl L. Waterman, Univ. of Iowa, Iowa City, Iowa.

OCTOBER 13-14.—MADISON, WIS.
League of Wisconsin Municipalities. Sec., Frederick MacMillin, 30 E. Johnson St., Madison, Wis.

OCTOBER 17-20.—OKLAHOMA CITY, OKLA.
American Water Works Association—Southwest Section. (Biltmore Hotel.) Sec.-Treas., Lewis A. Quigley, 3320 W. Berry St., Fort Worth, Texas.

OCTOBER 25-28.—KANSAS CITY, MO.
American Public Health Association. Exec. Sec., Dr. Reginald M. Atwater, 50 W. 50th St., New York.

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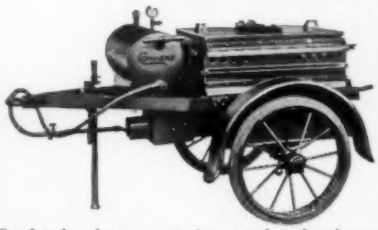

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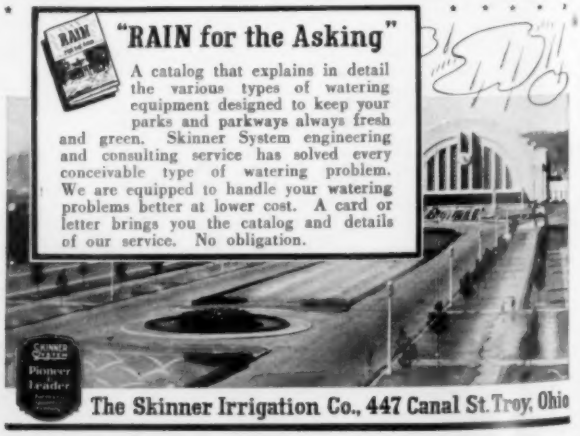

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News and Illustrations

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

Diesel Generators by Caterpillar

Some of the achievements of the diesel electric generator units manufactured by the Caterpillar Tractor Co., Peoria, Ill., are set forth in a new booklet recently issued by that company, Form No. 4658.

Among those in use by villages and municipalities is listed the 60-kw diesel electric generator unit in use by the city of Lima, Mont., 24 hours a day to furnish its electric current. To date, the diesel has a record of having operated 5,000 hours without any repairs. Another 24-hour-a-day job is that of the 30-kw diesel electric generator set supplying 110-volt alternating current to the town of Moorcroft, Wyo.

Their use does not stop here, however. Widely used in equipment for construction work, in quarries, and aviation fields, Caterpillar diesels equipped with a special close regulating governor can readily be installed for belt or universal coupling drive. They are available in eight sizes, from 20 to 80 kw, and have passed all tests for operation as single units, in multiples of two or more units, or in synchronism with large diesel engines or any exterior power source. Synchronization is quickly accomplished with a minimum of adjustment.

In direct current sets shunt or compound wound generators are furnished for 125-, 250-, or 600-volt two-wire, or 125- to 250-volt three-wire systems. Alternating current sets have generators of the rotating field type, suitable for single or parallel operation.

ONE OF THE NEW MODELS OF NON-CLOGGING SEWAGE PUMPS ANNOUNCED BY GARDNER-DENVER

A 1,500-GALLON SOUTH BEND FLUSHER POWERED WITH A CATERPILLAR D4400 DIESEL ENGINE, MOUNTED ON A GMC CAB-OVER-ENGINE CHASSIS, OWNED BY THE CITY OF DILLON, MONT.

New Non-Clogging Sewage Pumps

Two new types of non-clogging centrifugal pumps adapted for handling industrial wastes and raw unscreened sewage have been announced by the Gardner-Denver Co., Quincy, Ill. These types "J" and "K" are applicable to all services requiring the handling of liquids in which quantities of solids are held in suspension. They are built for both horizontal and vertical dry pit installations, and the complete line of necessary accessories for the vertical installations is also furnished, including shafting, guide bearings, compression and flexible couplings.

The impeller is of hard, close-grained alloyed cast iron with two streamlined blades, rounded to prevent catching stringy or fibrous material, and proportioned to permit the passage of the size solids indicated for each size pump, without clogging. The impeller is of the side-suction enclosed type, and is carefully balanced; it is keyed to the shaft and securely held in place with an impeller screw which conforms to the impeller contours and which is locked in place with a brass set screw.

The casings are of high tensile strength alloyed cast iron of more than usual thickness, and are symmetrical so that they may be used for both right- and left-hand pumps with the proper impeller and discharge nozzle, which can be placed in any one of eight positions.

Disc or flat type renewable double wearing rings are provided on the impeller and front head. This type of wearing ring does not hold abrasive materials between the wearing surfaces, but throws them out by centrifugal force.

The vertical pump base is made of close-grained alloy cast iron, with suitable openings to permit accessibility to the clean-out plug in the elbow and connection for the sump drain pipe. The intermediate shafting for vertical installations is turned and polished carbon steel and is free from surface strains which might possibly cause warping. It is accurately sized and generously proportioned to transmit the required power and to withstand service conditions.

Copper Rings Check Roots Entering Sewer

A method of root-proofing sewers has been developed by the A-B-C Manufacturing Co., 221-223 South 4th Street, Quincy, Ill., by the insertion of open-end flat rings of copper in the bell between the shoulder of one length and the spigot end of the next length of sewer pipe. Dampness causes the copper to corrode so that corrosion forms on the surface of the copper rings, creating a form of basic copper salts which are extremely poisonous to plant life. These salts lie directly in the path of an entering root. As every root has a very delicate and sensitive feeding tip, it is stopped immediately by this barrier.

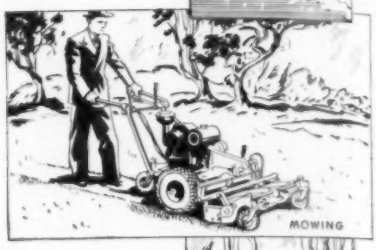
The manufacturer claims that these Stop-Root Rings, which are made for each standard size of pipe and with radial corrugations that not only enlarge the field of protection but provide a springed action to hold the ring tightly in place against the shoulder at the base of the socket, will last practically indefinitely. When standard jointing materials and methods are used, the manufacturer offers to guarantee that any sewer "will for a period of ten years be free from trouble caused by roots entering at any juncture of socket and spigot which has been properly equipped with a Stop-Root Ring."

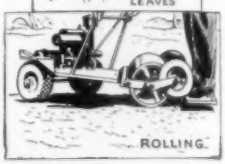
Use This Equipment *ALL YEAR*

POWER MOWING
ROLLING • "RAKING"
SNOW SWEEPING

Combined in the

IDEAL Caretaker





There are no idle months for this practical, lawn-care equipment. It is an investment that pays for itself quickly because of its year-around utility.

Efficient, low cost *mowing* is provided by the "Caretaker's" exceptional advantages, full-floating, power-driven cutting unit with 8" reel. Close trimming around flower beds, drives, etc., is easier and faster. A wide variety of mowing, rolling and spiking conditions are efficiently handled.

The *sweeping* assembly provides additional efficiencies—sweeping dead grass and debris from lawns in the spring, windrowing leaves in the fall and sweeping snow from walks, driveways, platforms and skating rinks in the winter. Converting the "Caretaker" from a power mower to a power sweeper can be done in less than 30 minutes.

A complete catalog of Ideal Power Lawn Mower equipment will be sent upon request, or our nearest representative will call, if you desire.

IDEAL POWER LAWN MOWER COMPANY
400 Kalamazoo Street, Lansing, Michigan

NEW YORK BRANCH:
12 Harrison St.,
New Rochelle, N. Y.

CANADIAN DISTRIBUTORS:
Aikenhead Hardware, Ltd.
17 Temperance St., Toronto, Ont.

AUTOMATIC ASPHALT PATCH PLANT

H&B

A COMPACT, EFFICIENT, ONE-UNIT ASPHALT REPAIR PLANT.

FOR ACCURATE BATCH MIXING.

STATIONARY OR PORTABLE TYPES.

MANUFACTURED BY

HETHERINGTON AND BERNER, INC.
ENGINEERS AND MANUFACTURERS
KENTUCKY AVENUE & WHITE RIVER •• •• INDIANAPOLIS, INDIANA

Two-Stage Centrifugal Pumps

A new bulletin giving complete specifications and operating characteristics of the Cameron Class GT two-stage centrifugal pump has recently been issued by the Ingersoll-Rand Co. These pumps are two-stage ball-bearing units designed to operate at modern motor, turbine and engine speeds. They are available in capacities from 100 to 2,200 gallons per minute for discharged heads up to 800 feet or 350 pounds per square inch.

Two pages of typical installations of these pumps are pictured in the bulletin. No. 7067, obtainable from the Ingersoll-Rand Co., 11 Broadway, New York.

Equipment to Aid in Water Conditioning

The Floc-former is the latest piece of water-conditioning equipment to be brought out by The Permutit Co., 330 West 42nd Street, New York. Working under the theory that a good floc formation is essential for the removal of turbidity and color from water, they have produced a means of mechanical agitation resulting in a floc that is large in particle size, tough and easily settled. For waters low in suspended solids and high in color, good coagulation is further assisted by the addition of clay or recirculated sludge feeding.

The newly designed Floc-former employs vertical shafts with self-aligning couplings at the top to support the entire weight of the agitators. Motors and speed reducers are also at the top, thus eliminating underwater chains or submerged load-carrying bearings. The agitation is carried out in two steps. In the first, the chemical and water are thoroughly mixed by an agitator driven by its own motor, at a high speed. This "flash mixing" must be carefully timed to suit individual water conditions. The second step is a longer period of agitation at a much slower speed which greatly assists the precipitate that is forming to agglomerate into heavier and tougher particles. These particles readily settle to the bottom of the settling tank or basin. The agitator is so designed that "non-agitated" zones at the center of rotation do not occur.

Three different arrangements are offered. Arrangement A is a compact compartment within a vertical cylindrical settling tank, and has a central cylindrical downcomer. In Arrangement B the floc is formed in one tank and settling carried out in a second. Arrangement C is employed for concrete gravity designs where the depth is limited by the available head and where rectangular tanks are desired.

Light-weight Line of Centrifugal Pumps

The Gorman-Rupp Co., Mansfield, Ohio, has just introduced what it believes to be the lightest-weight self-priming centrifugal pumps with like capacities in the world. Four different pumps comprise this family of lightweights: the "Midget," weighing in at only 52 pounds but with a capacity of 5,300 gph; the "Bantam," a 79-pounder throwing 7,500 gph; the "Hawk," with a weight of 103 pounds and a capacity of 10,000 gph; and the

A YOUNG LADY OF 15 HOLDS ONE OF THE NEW GORMAN-RUPP LIGHT-WEIGHT PUMPS

"Eagle," which tips the scale at 118 pounds and delivers better than 15,000 gph. All four pumps are rated at a total head of 20 feet, including a 5-foot suction list.

The four pumps are built around a new principle that assures rapid priming on all suction lifts up to a practical 25 feet. Their new construction principle assures continuous operation regardless of dirty water conditions, since with the strainer on the suction end of the hose the pumps are guaranteed not to clog. They are powered with four-cycle air-cooled, anti-friction bearing gasoline engines, and an automotive-type high tension magneto ignition gives quick, positive starting.

These new light-weight self-priming centrifugal pumps are used for filling tank wagons; draining small trenches and ditches of surface water; de-watering barges, boats, manholes, basements, small swimming pools; and irrigation. Many cities are using them for fire, water and street departments.

The Gorman-Rupp Co. has just issued illustrated literature describing this new line in detail, available on request.

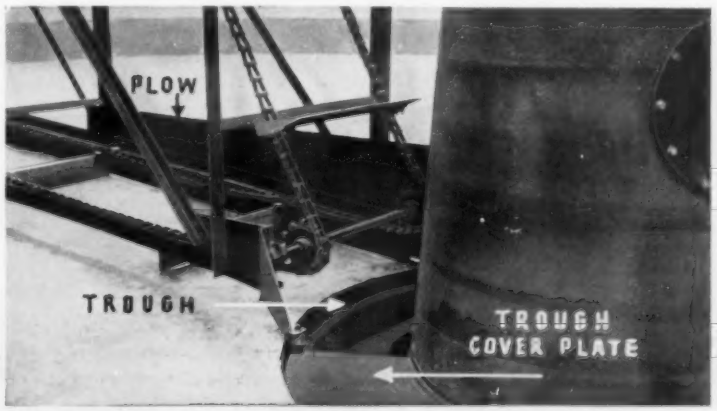
Circular Settling Tanks for Sewage

The new Link-Belt Circuline sludge collector for circular tanks improves the efficiency of removal of sludge. The efficiency of a settling tank depends largely upon the means of introducing the influent into and distributing the flow throughout the tank. This new collector made by Link-Belt Co., 2045 West Hunting Park Avenue, Philadelphia, Pa., introduces the influent through an inverted syphon and a vertical pipe, discharging at the center of the tank, where the flow is deflected downward by a circular solid baffle. Around this is a circular perforated baffle which uniformly distributes the flow throughout the tank.

A Circuline equipped tank is provided with a revolving bridge having a sludge plow and a Straightline conveyor which removes the settled solids into an annular covered sludge channel from which the sludge is withdrawn. The entire floor area of the tank is cleaned of settled solids during each complete revolution of the bridge, thus permitting a very slow rotation of the bridge and insuring minimum disturbance to settling and to settled solids.

When it is desired to remove scum from the surface of the liquid, a skimming plate extending between the center and periphery of the tank is provided. The return run of the Straightline collector conveys the scum collected by the skimming plate to the periphery of the tank, where the accumulated scum is automatically deposited into a scum-box and then flushed to the point of disposal.

The Link-Belt Circuline collector for both sewage and water-works settling tanks is described completely and illustrated thoroughly in Book No. 1642 which may be secured direct from the Link-Belt Co.



THE CIRCULINE SLUDGE COLLECTOR, SHOWING THE STRAIGHTLINE PLOW MOVING SLUDGE TO THE ANNULAR SLUDGE TROUGH

Protect Your Shade Trees with a BEAN Park Sprayer

It takes **pressure** and **capacity** in a spray outfit to reach the tops of the tallest trees and to move rapidly from tree to tree, thoroughly drenching each one as you go. And it takes downright ruggedness of construction to deliver 20, 35, 55 or 60 gallons a minute at 600, 700, or 800 pounds pressure. That's what you get in BEAN Park and Shade Tree Sprayers. WRITE FOR CATALOG AND FULL INFORMATION.

JOHN BEAN MFG. CO.

Division Food Machinery Corporation

5 Hosmer St.
Lansing, Mich.

105 W. Julian St.
San Jose, Calif.

HEIL GARBAGE DUMPERS

Heil custom builds Hydraulic Garbage Dumpers to suit your loading and dumping conditions—Ask experienced Heil engineers for recommendations based on your requirements—Address:

THE HEIL CO.
GENERAL OFFICES
3000 WEST MONTANA STREET
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FACTORIES: MILWAUKEE, WISCONSIN; HILLSIDE, NEW JERSEY

Branches and Distributors Everywhere

Why Buy a MOWER that does but half the job?

The GRAVELY will work under every condition. The Power Driven Sickle Mower, illustrated, will cut everything . . . the rough places . . . spots where you've had to use hand scythes . . . even sprouts a full ½" thick . . . and a great big swath every time.

To this same tractor you can attach a 30-inch Reel Type Mower . . . two mowers for the price of one.

Write for Facts

Gravely Motor Plow and Cultivator Co.
Box 858 **Dunbar, W. V.**

Stewart IRON AND WIRE **FENCES**
. . . for every purpose

Send for catalog giving complete details on Iron and Chain Link Wire Fence, Ornamental Iron and Wire Work and other Stewart Products

The STEWART IRON WORKS CO., Inc.
525 Stewart Block • Cincinnati, Ohio
"World's Greatest Fence Builders Since 1886"

During May we hope you will remember to mention THE AMERICAN CITY.

The Accelator Softener

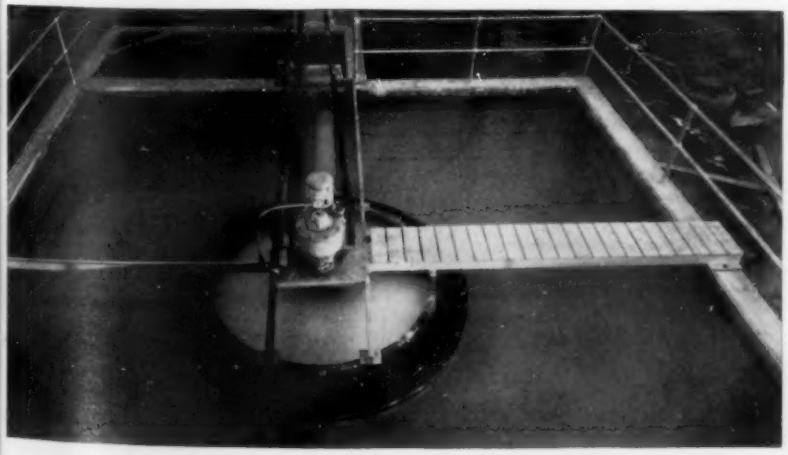
The Accelator, developed by International Filter Co., is an improvement in water softening, incorporating the principles of mass action and catalysis with a new and more rapid method of clarification, which results in more effective treatment not only in softening but also in stabilization, iron removal, pH adjustment and other types of water purification.

Raw water introduced into the reaction chamber of the Accelator is mixed there with circulating slurry of previously precipitated solids and the proper dose of whatever chemicals the treatment requires. New solids resulting from chemical reactions are formed in the reaction chamber in the presence of the tremendous depositing surface of the circulating sludge particles, as a result of which the reactions involved are greatly hastened, and a large portion of the new solids is deposited on the old particles, instead of forming as new small ones. The augmented slurry circulates from the reaction chamber to the outer portion of the tank, where clarification takes place, the treated water separating and rising uniformly to clear-water launders, while the slurry left behind circulates inwardly to the reaction chamber, where it functions again in treatment.

Excess solids in the slurry pool pass over a skimming weir into a concentrator, from which they are withdrawn as a thick sludge. A proper volume of slurry is thus maintained in the treating tank.

Time and space requirements are greatly reduced by the rapidity with which reactions and clarification take place in the Accelator. As a result, Accelator treating tanks have approximately one-fourth the area and volume of tanks heretofore provided for mixing, coagulation and sedimentation. Furthermore, the treated water is of better quality, and savings in the amounts of chemicals required are effected.

Additional information on the Accelator will be furnished on request by International Filter Co., 59 East Van Buren Street, Chicago, Ill.



THE NEW INTERNATIONAL FILTER ACCELATOR FOR WATER SOFTENING

Junior Bucket Loader

A new full crawler-mounted, high-capacity, self-feeding bucket loader, to be known as the Model 552, has just been announced by Barber-Greene Co., of Aurora, Ill., manufacturer of standardized material-handling machines. This new machine is adaptable for loading bulk material such as sand, gravel, crushed stone, earth, coke, cinders, etc., from ground storage to trucks.

Among the many features contributing to its high speed and low operating cost are that it operates continuously, gives a steady flow of material, has self-feeding spirals and, being full-crawler-mounted, is quickly moved from one set-up to another within the yard or pit. Its boom may be laid back for low traveling clearance for covering greater distances.

A New Indicator for Combustible Gas

A new combustible gas indicator for measuring directly the combustibility and explodibility of gas-air mixtures in sewers, sewage-treatment plants, or conduit manholes, has been developed by the Davis Emergency Equipment Co., Inc., 55 Van Dam Street, New York. The instrument weighs only 6 pounds, complete with batteries, and the dimensions of the instrument panel are $6\frac{3}{8}$ x $5\frac{3}{8}$ inches, and the depth of the case $3\frac{3}{4}$ inches. Current is supplied by two standard dry batteries, thus obviating the difficulty of obtaining special batteries. Two batteries give $3\frac{1}{2}$ hours of continuous operation, and, when used intermittently, as is usually the case, they permit a large number of tests to be made before renewal is required.

The resistance of the platinum filaments used in both the active and comparison cells is controlled within very close limits, which insures the same accuracy found in larger instruments. The two filaments are interchangeable, making maintenance more convenient.

A 3-inch meter shows directly the percentage of the lower explosive limit of the mixture being sampled. The meter is mounted under the panel with only the scale showing, and is protected from damage by shatter-proof glass. A push-button changes the meter reading to volts for checking purposes, and the change can be made while sampling. Tests can be made in a few seconds and thus guard against the danger of introducing flames or sparks or doing welding or other "hot" work in flammable or explosive atmospheres.

THE BARBER-GREENE MODEL 552 BUCKET LOADER

Meter Company Appoints Dealer

The Cochrane Corporation, Philadelphia, manufacturer of meter equipment for water works, announces the appointment of C. J. Gaskell Co., 1011 Falls Building, Memphis, Tenn., as district representative for all of its products in Arkansas, western Tennessee and northern Mississippi.

Bottle-Tight Joint Shown in New Catalog

The U. S. mechanical joint has been described as involving the well-known engineering principle of the "stuffing-box." Its four elements are a flange, cast integral with the pipe, at one end; a rubber or other type of gasket; a cast iron follower ring; and the bolts necessary to assemble the joint.

The new catalog published by the U. S. Pipe & Foundry Co., General Offices, Burlington, N. J., shows the six steps used in assembling the joint, and lists the various types of gaskets for each service. Several pages of typical installations in the gas, water, sewer and industrial fields follow.

There are three classes of these fittings, all made in accordance with the provisions of American Gas Association or American Water Works Association specifications where applicable, and these too appear in the catalog with their corresponding weights and diameters. Class 50 is suitable for a maximum hydraulic working pressure of 50 pounds per square inch, Class 150 for 150 pounds, and Class 250 for 250 pounds.

GOOD NEWS SPREADS FAST

Protect your pool patrons with PERMUTIT water — Conditioned automatically!

IT PAYS TO PLAY SAFE

How would you like to have PURE, *safe* water—water that is actually purer than drinking water standards? How would you like to keep it that way all day—*seven days a week?* Permutit makes that easy. Permutit equipment removes dirt, color and germs from water. *And it works automatically.* It purifies and re-purifies every drop of water in your pool three or more times a day! This saves time of draining and cleaning pool. It saves pumping in fresh water. It allows seven-day-a-week operation (won't the public cheer!)

HURRY—SUMMER IS COMING

Forget your worries about swimming-pool water. You can assure your taxpayers of pure, SAFE water and cut pool expenses at the same time when you install Permutit Equipment. Write today for 40-page manual . . . swimming-pool layouts . . . specifications. No obligation. Address The Permutit Company, Dept. G3, 330 West 42nd S., New York.

PERMUTIT SWIMMING-POOL EQUIPMENT

Automatic Filters • Hair Catchers • Suction Cleaners • Chlorinators • Chemical Test Sets • Lights (for underwater illumination) • Recirculating Backwash Pumps • Special Pool Fittings • Inlets • Outlets • Scum Drains, • etc. • Heaters • Ammoniators • Automatic Chemical Feeders.

Permutit
The Water Conditioning Headquarters
over 25 years

Wherever waste accumulates!

Solar Self-Closing **Receptacles**

are a tremendous help. Place these receptacles in convenient locations, wherever crowds gather, and **they will be used** because they are **easy to use.** These cans are **quickly emptied:**—just lift out the inner bag. They **outlast** other types of cans. Give them a trial! Start with two or three. **Complete description and prices on request.**

SOLAR-STURGES MFG. CO.
MELROSE PARK, ILLINOIS

USE G-E POLICE RADIO FOR BETTER PROTECTION

Give your city the *continuous* protection afforded by G-E police radio equipment—reliable, sturdily constructed, carefully engineered by an experienced leader in radio communication. Radio Department, General Electric, Schenectady, N. Y.

GENERAL ELECTRIC 900-6

Just Published

THE MASTER PLAN

With a Discussion of the Theory of Community Land Planning Legislation

by Edward M. Bassett

The making of the Master Plan is an important part of comprehensive city and regional planning. The author here sets down his considered advice regarding this Master Plan—what it should and should not contain, how it differs from the official Map, the necessity of keeping it plastic. $2.00

RUSSELL SAGE FOUNDATION
130 East 22d Street New York, N. Y.

RICHARD G. HEXT, NEW ADVERTISING MANAGER OF LITTLEFORD BROTHERS

Littleford Appoints New Advertising Head

Littleford Brothers, Cincinnati, Ohio, manufacturers of road maintenance equipment, have announced that their new Advertising Manager will be Richard G. Hext.

Mr. Hext is new to the equipment industry, but comes to Littleford with a background of fifteen years' experience in the advertising field. He is a native of Cincinnati, was formerly connected with A. S. Boyle Co. and Proctor & Collier, and in recent years has been located in Chicago and Jersey City, N. J.

Control Equipment for Water and Sewage Plants

The Crane Co., 836 South Michigan Avenue, Chicago, Ill., has recently issued a 50-page illustrated catalog with plastic binding which contains a great deal of information regarding Crane water control equipment for sewage-treatment plants, water-filtration plants and pumping stations. It includes descriptions, illustrations and specifications of sluice-gate and floor stands, also shear-gates, flap-valves and mud-valves.

Sluice-gates are only one item from the complete line of Crane equipment for water control. Municipal officials when considering the installation of a water-filtration plant, a sewage-treatment plant or a new pumping station, or when replacing worn equipment, should consult the complete Crane No. 52 catalog. Copies of this smaller catalog, or of the larger catalog where it is desired, may be secured direct from the Crane Co. by mentioning THE AMERICAN CITY and including a description of the specific needs of the city.

Corporate Name Changed

Stockholders of The Barber Co., Inc., 1600 Arch Street, Philadelphia, Pa., at the annual meeting held April 27, approved a change in the corporation's name to Barber Asphalt Corporation. The corporation is the distributor of Trinidad Native Lake asphalt and Gilsonite.

Sewage Ejector for Municipal Service

Flush-Kleens, unique sewage pumps with a self-cleaning strainer, are illustrated and described in an attractive new bulletin just published by the Chicago Pump Co., 2349 Wolfram Street, Chicago, Ill. Flush-Kleens never clog, it is claimed, and require no attention other than periodical lubrication.

They are installed in duplex sets, according to the bulletin, with an "automatic alternator" to transfer the operation from one pump to the other. Only one pump operates at a time, and simultaneously sewage flows into the basin through the idle pump. Coarse solids are stopped by the strainer in the idle pump and are held in the strainer chamber built in the discharge line of the pump. Only water passes into the basin.

When the idle pump starts, the accumulation of coarse solids in the strainer chamber is flushed out with the water, just like backwashing a filter, and is discharged to the sewer. A check-valve in the inlet is forced shut when the pump starts. This prevents the pump from discharging back through the inlet line. Each pump is float-controlled, and the automatic alternator transfers the operation from one pump to the other.

Change of Personnel

The Simplex Wire & Cable Co., of Cambridge, Mass., announces the election of W. S. Davis, former Sales Manager, to the position of Vice-President. Mr. Davis has been associated with the Sales Department of the Simplex Co. for the past 41 years. G. L. Roberts, Assistant Sales Manager since 1927, succeeds Mr. Davis as Sales Manager, and G. A. Grauer has been appointed Assistant Sales Manager.

Radio Frequency Checker

To enable police radio operators to check station frequency periodically or continuously, the Radio Department of the General Electric Co., Schenectady, N. Y., has developed a new frequency monitor which may be set on the operator's desk. It works from 110-volt A-C, 60-cycle, single-phase power, and plugs into any outlet. The equipment is entirely self-contained and requires no tuning or adjusting. The crystal is mounted in a plug-in-type crystal cell which determines the frequency of the monitor. Ordinarily the monitor is supplied with one crystal cell adjusted for a given frequency.

Additional crystal units can be obtained for the several ultra-high-frequency and medium-high-frequency police-frequency assignments. Frequency checking is accomplished merely by listening on a pair of headphones to the beat note between the monitor frequency and the transmitter frequency. By adjusting the transmitter frequency, this beat note can be held to a low value which complies with the requirements of the Federal Communications Commission.

Rubber Gaskets for Ceramic Pipe

After years of laboratory and field work, The B. F. Goodrich Company, Akron, Ohio, has developed a rubber joint for ceramic bell-and-spigot pipe known as the "Flexlock" joint. It is available for use with specially constructed vitrified clay pipe in low-pressure service, such as for sewers and in temperatures not exceeding 175 degrees Fahrenheit. The joint is simple in both design and application. It consists of a rubber gasket having internal and external circumferential ribs which grip the bell and spigot of the pipe. While the spigot is easily inserted in the gasket, the shape of these corrugations, combined with the resilience of the rubber, forms a multiple seal which resists any tendency of the pipe sections to pull apart. The effect of pressure serves to make the joint tighter and prevents leakage.

Since it is known that roots will enter a sewer joint only when leakage exists, the Flexlock joint eliminates this sewer trouble. Because of its resilience, the

FLEXLOCK RUBBER PIPE JOINT INSTALLED IN BELL OF 36-INCH CERAMIC PIPE

joint permits a certain degree of angularity between the joined sections. Therefore, settling of the pipe or other disturbances to a reasonable degree do not affect the tightness of the joint. Contraction or expansion due to temperature changes do not break the joint. Pipes can be leveled and bedded to grade after the joint is made. The danger of pipe breakage due to pressure or vibration is minimized because the rubber gasket tends to cushion the pipe and absorb shock.

Flexlock joints are easily applied by ordinary labor and require no special skill. Corrosive conditions do not impair their efficiency, particularly as the corrosives present in sewers have practically no effect on rubber.

The addition to the rubber of ingredients such as Azerite, mixed in small quantities, combats oxidation similar to chromium to steel.

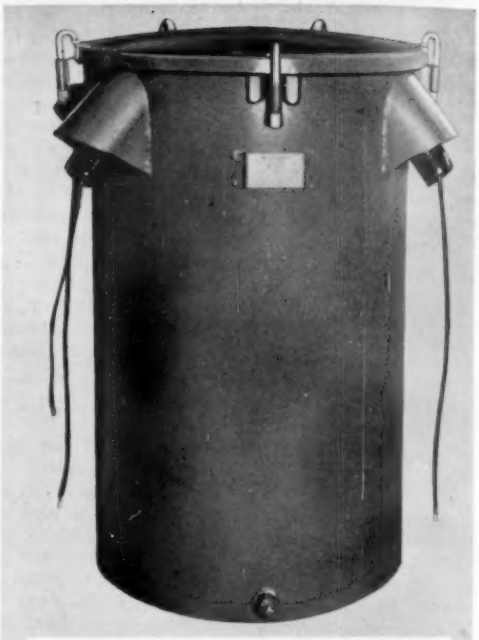
Depend on WESTINGHOUSE . . . for the UNSEEN SAFETY FACTORS In Modern Street Lighting

There's more to street lighting than visibility . . . as cities with modernized street lighting have discovered. Detroit with its new lighting installation, for example, has adopted Westinghouse Constant Current Regulators and Isolating Transformers as integral parts of its Saving-Lives-With-Light program. Officials of the Detroit Public Lighting Commission are assured of safety, high efficiency and trouble-free operation from their now-famous Detroit street lighting system.

The new Westinghouse Constant Current Regulator includes such important features as straight line current regulation, co-ordinated insulation, spring mounted mechanism, ball bearings at all moving points and cylindrical copper bearing steel tank. High insulation strength and unchanging current regulation are guaranteed by vacuum treatment of the unit after it has been assembled in its tank complete with oil. Because the current can be so accurately adjusted at the factory, no alteration of the regulating mechanism is necessary in the field.

The Isolating Current Transformer for each lighting unit is also an "unseen safety factor" vital to a series street lighting circuit. The combined isolating transformers and disconnecting potheads in the base of the lighting standards provide complete isolation from the high voltage series circuit and a ready means for disconnecting a single unit without an outage of the entire circuit. The new Westinghouse Type WDC transformer provides complete safety for servicing and testing.

For complete details call your local Westinghouse Lighting Specialist, or address Westinghouse Electric & Manufacturing Company, Lighting Division, Edgewater Park, Cleveland, Ohio.



Illustrated above is the Westinghouse pole type Constant Current Regulator, Type CP. A subway type Regulator is also available.

★

The Westinghouse Reflectolux Sr. luminaire, designed for use with lamps up to 750 watts, has been widely adopted by municipalities as a solution to the deplorable rise in night traffic accidents. Reflectolux has a combination of new features that provide more light, less maintenance, greater flexibility and durability than have ever been offered in a street luminaire. Write for the new book, SAFETY WITH LIGHT.

Westinghouse Type WDC Transformer provides a means of operating and insulating the efficient high current 15 and 20-ampere lamps from a 6.6-ampere series circuit.

WHEN YOU THINK OF *Lighting Equipment* THINK OF

Westinghouse

John G. Phillips a Director of I. B. M.

At an International Business Machines Corporation stockholders' meeting on April 5, John G. Phillips, Secretary and Assistant Treasurer, and former secretary to the President, was made a director. At this meeting, President Thomas J. Watson referred to the importance of research and development work, stating that in the last 24 years 1,301 patents have been granted to the company.

New Line Marker with Spray Unit

The base of the new traffic line marking machine manufactured by Simons Paint Spray Brush Co., Dayton, Ohio, is a structural steel, electrically welded frame. This is supported by three pneumatic-tired wheels of the disc type. An air compressor is "V" belted to an air-cooled gasoline engine which has a foot starter. The fuel tank carries sufficient gasoline for six hours' operation.

In operation the compressed air passes to the air reservoir from which it is piped to a pressure regulator valve to give the correct pressure on the liquid in the 10-gallon paint tank. This furnishes a steady supply of paint to the spray nozzle located between two baffle plates which determine the width of the line to be sprayed on the pavement. The line may be from 3½ to 6 inches wide in half-inch increments. It requires about four minutes to change the width of the line. For towing, a cable and hook is attached to the baffle plates, by which they are lifted about one inch from the pavement.

An interesting and very essential detail of the machine is a pipe which conveys the exhaust gases from the engine to a point just forward of the spray nozzle. These gases blow all dust, loose dirt and gravel from the surface, cracks and crevices, just ahead of spraying. A clean paved surface insures a greater adhesion of the paint, reducing the number of operations for repainting, which is always in direct proportion to the density of the traffic. A pointer on the machine makes it possible for the operator to follow an old line or guide mark for a new traffic line.

New Injection Nozzle for Hypo-Chlorinators

A new injection nozzle for connecting hypo-chlorinators into pipe lines has been developed by Proportioneers, Inc., 9 Codding Street, Providence, R. I. The new nozzle is made of a special metal not affected by hypochlorite, is leak-proof and practically unbreakable, and will operate at a maximum pressure of 250 pounds.

An outstanding feature of the nozzle is that if the discharged hose bursts, the nozzle closes automatically. It has large openings which prevent clogging, is easy to install, requiring only a ¼-inch tap, and is made durably to last for years.

Power Units Meet Many Needs

One of the first considerations in selecting a power unit is the importance of obtaining an engine of the right size for the job. The International Harvester Co., 180 North Michigan Avenue, Chicago, Ill., has ten different power unit models, providing the correct size engine for practically any job requiring up to 110 maximum horsepower. Besides 4-cylinder and 6-cylinder diesels, the International line includes 4- and 6-cylinder models with various bores and strokes for operation on gasoline, distillate, and natural or manufactured gas.

This company, which pioneered in the introduction of kerosene tractors and farm engines 25 years ago, has kept step with the development of new fuels and can offer information on their most economical use. An extensive variety of special equipment items assures the unit's adaptability to particular jobs.

An example of one of these power units now in use is that which is owned by Prairie du Sac, Wis., a town of 1,000 inhabitants. Auxiliary and emergency units are used to operate the municipal water plant, which has a capacity of 375 gallons per minute.

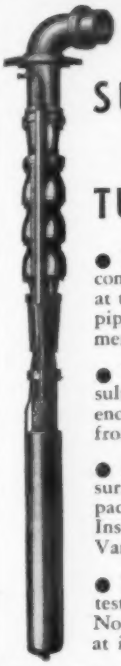
Simple Pumps Easy to Operate

A pump that will operate in straight or crooked cisterns or natural bodies of water is the new submersible turbine pump of the Byron Jackson Co. Although simplicity of design is its outstanding feature, it is ideal for residential districts because of noiseless operation and may be used in restricted areas because it requires no above-ground pump-house to protect the motor. The entire unit is attached to and supported by the discharge pipe, and the only other connection with the surface of the ground is a lead sheathed, armored, submarine cable and a small copper oil tube.

Of all the differences in construction and design between this new unit and the usual type turbine pump assembly, the motor undoubtedly is outstanding. It is a squirrel-cage induction type electric motor, but relatively small in diameter. Furthermore, it is placed below, not above, the turbine bowls, and the motor remains submerged in the liquid pumped at all times. Electrical parts and motor bearings are all enclosed in an oil-filled case with a mercury seal where the shaft passes through at the top, thus avoiding contact with the liquid pumped. The motor and the turbine units are close coupled.

Something like 12,000 hp of these submersible motors are now in service pumping against heads up to 860 feet. The very first installation 450 feet in the well, and powered with a 50-hp motor pumping against a 475-foot head, still delivers its rated 250 gallons of water per minute. More complete information is offered by Byron Jackson Co., Department 203, Los Angeles, Calif.

PUMP FACTS for PUMP USERS



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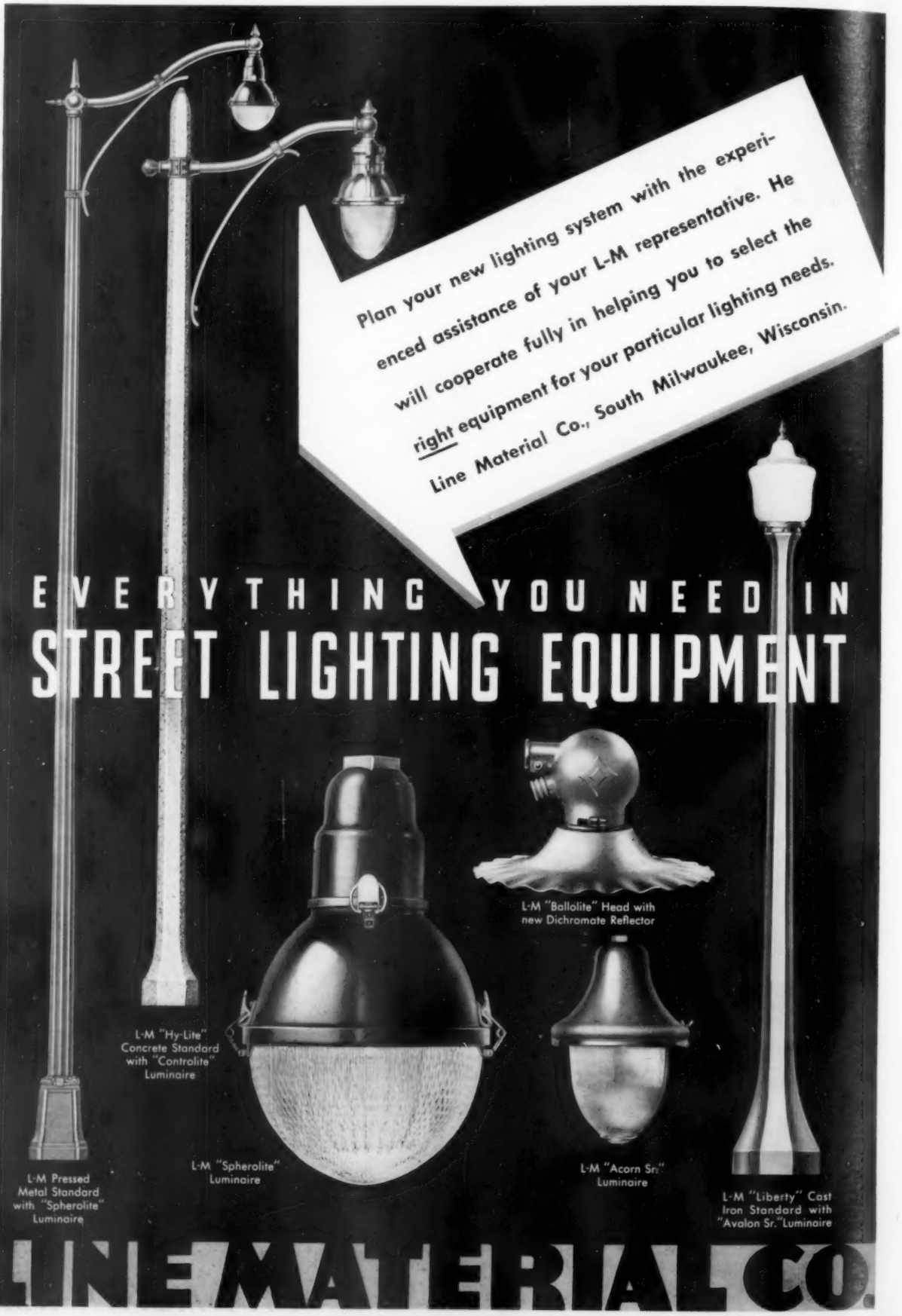
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Outdoor Lighting

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Lighted Water

For More and Safer Swimming

By E. B. KARNS
Lighting Division, Westinghouse Electric & Mfg. Co.

MODERN science is providing municipal swimming pools with underwater light as well as sanitation.

The first plunge into the transparent depths of a lighted pool is a new thrill—a new feeling of safety and relaxation. The spectator, too, experiences a new pleasure in his ability to distinguish every movement of the swimmer both above and below the surface of the water. Underwater lighting draws night attendance.

The city of Los Angeles high-school authorities, after a detailed study of their swimming pool problems, decided that safety was a most important factor, and that an effective and adequate underwater lighting system was therefore essential; overhead lighting was good, but only a small amount of the light penetrated the water, most of which was reflected, causing glare. With underwater lighting, a major portion of the light is retained between the walls of the pool, adding effectiveness to both lifeguards and swimmers.

The joint report of the State Sanitary Engineers and the American Public Health Association says:

A complete system of artificial lighting must be provided for all pools, bathing beaches, bathhouses and dressing rooms which are to be used at night.

Lighting fixtures must be of such number and design as to light all parts of the swimming pool and the water therein.

Arrangement and design of lights must be such that lifeguards may see clearly every part of the bathing waters at a beach or pool, and all springboards, towers, floats and other appurtenances, without being blinded by the light.

A large manufacturer of filtering equipment recently mailed a questionnaire to owners and operators of a number of swimming pools asking what changes, if any, would be made if they were rebuilding their pools. Where improvements were considered, "underwater lighting" was the change most frequently mentioned.

Deciding factors in favor of underwater lighting are safety, enforced sanitation, increased patronage—and beautification. By the use of colored lenses, almost any color scheme may be developed to harmonize with the general surroundings or to add "atmosphere."

Where the tile work is blue and white, the lighting scheme can be made to correspond, using blue lenses on some of the lighting units and white lenses on others. Each color can be on a separate circuit, making it possible to use either color or a combination.

How Effective Underwater Lighting May Be Obtained

Years of experience in underwater illumination have developed the design of pool lighting and the installation methods described in this article.

For adequate illumination, when the water is reasonably clear and the pool walls are of light-colored material, 2 to 3 watts per square foot of surface are sufficient for the safety of the swimmer. A number of different sizes of underwater

MUNICIPAL SWIMMING POOL AT CARTHAGE, MISSOURI

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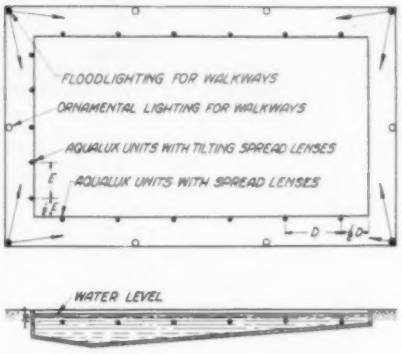
floodlights are available, the size of the projector depending on the width of the pool. In general, projector sizes may be selected as follows:

250 to 400-watt units for pool widths up to 40 feet
500 to 1,000-watt units for pool widths up to 75 feet
1,000 to 1,500-watt units for pool widths over 75 feet

The total wattage required and the lamp size having been determined, it is a simple matter to figure the number of floodlights, taking into account the spacing.

Since pools are ordinarily built with a sufficient depth for diving at one end, floodlights should be located in the wall at the deep end, as well as in the two sides. They are seldom required in the shallow end. The deep-end units, equally spaced in the wall, should comprise from 25 to 30 per cent of the total wattage. The remaining units are laid out by selecting a tentative value for the spacing (D) on the layout (Fig. 1). This distance (D) should not be over 15 feet, and 7 to 10 feet is preferable. The end units should be located at about half the regular spacing (that is, ½·D) from the end walls.

All units should be installed at a depth of approximately 30 inches below the surface of the water.



PROPER SPOTTING OF LIGHTS

Example:

Assume dimensions of pool are 30 x 60 feet.
Wattage required: 30 x 60 x 2.5 = 4,500 watts.
Number of 250-watt units required = $\frac{4{,}500}{250}$ = 18.
Units required in deep end: 25 to 30% of 18, or 5, giving a spacing (E) of 5 feet in the end wall.
Units required for sides: 18 — 5 = 13, or the next highest even number, 14.
Spaced 7 on each side, gives a spacing of 8 feet, 7 inches (D), and (½ of D) 4 feet, 3 inches.
The pool therefore requires 19 units, or 4,750 watts, or 2.64 watts per square foot.

Outdoor Pools

For outdoor pools, sufficient supplementary overhead lighting should be provided for the adequate illumination of the sidewalks and diving boards. This may be accomplished by the use of ornamental street-lighting standards and luminaires, or floodlights. The standards should be spaced not to exceed 60 feet. The floodlights should be mounted approximately 25 feet above the walkway and with a maximum spacing of 120 feet.

The underwater floodlight should be impervious to water seepage at ordinary depths and installed in a niche or wall receptacle (see Fig. 2). This method makes relamping and maintenance of the unit possible without drainage of the pool and interruption of electrical service.

Indoor Pools

Additional direct overhead lighting for indoor pools detracts from, rather than aids, underwater lighting. If adequate wattage in underwater floodlighting is installed, sufficient light is reflected from the pool to the ceiling, and back down, to illuminate the walkways to a low intensity. This may be supplemented by wall brackets or a system of indirect or semi-indirect lighting more or less decorative.

Underwater lighting in swimming pools prolongs their use beyond the hours of daylight, insures safety for the swimmers, and reveals the inviting beauty of sparkling waters lighted from within.

Getting Somewhere in Highway Lighting

AS MORE and more statistical data are obtained, it becomes evident that night highway accidents are increasing more rapidly than day highway accidents. Especially impressive is the fact that, in those states where effective safety programs have brought about a decreasing trend in day highway accidents, night accidents are still increasing.

Accumulating evidence is conclusively proving the necessity for lighting heavily-traveled and hazardous highways.

Leading students of highway safety are generally agreed on this necessity. As yet, however, there is no general agreement as to the highway mileage on which the cost of lighting will be justified by the economic benefits received. Some authorities consider that it will be sufficient to light as little as 3 per cent of the 300,000 miles of main-trunk highways; others place the figure as high as 25 per cent; but there is general agreement that lighting should be provided for at least 10,000 miles of those rural highways carrying the heaviest volume of night traffic.

In such a situation, the sensible program seems obvious. Each state, especially the more populous states, should enter upon a definite program of highway lighting; but such a program should be initiated on a modest basis, and should be advanced only to the degree that carefully compiled statistics show the cost is justified by the social benefits received.

The design of the installation involves highly specialized technical knowledge, and there is in this country a group of engineers of acknowledged competency and creative ability in this field. A comparison of installations separately designed and built to specified costs by these engineers would furnish valuable information as to types and sizes of lamps and the equipment now available, the amount of illumination considered necessary for safety, and the kind of lighting that can be provided for a grand total of, say, 30 cents and 45 cents per lineal foot of lighting per year.

Here is a program which would develop information that would materially assist the further course which highway-lighting policy should take with respect to unit expenditures and technical practice. Let each state decide to light a stretch of highway divided into a number of 4-mile sections. Place two sections under each of the country's best-qualified highway-lighting engineers, one section to be limited to a total annual cost of 30 cents per foot, and the other to 45 cents per foot. It is also suggested that these test projects could be submitted to the Illuminating Engineering Society's Committee on Street and Highway Lighting for detailed recommendations. It would furnish a good opportunity to include one or two additional projects at least 25 miles long.

During the next 20 years it is quite possible that much more than $50,000,000 will be spent on the installation of highway-lighting systems. An organized procedure now, such as proposed in the foregoing, might result in the recognition of a quality and efficiency of highway lighting which would encourage the more rapid extension of highway lighting over the 10 to 50 thousand miles of main-traveled roads needing it.

New Colored Floodlighting

AT THE 1939 Golden Gate International Exposition in San Francisco, 2,300 new fluorescent tubes in specially designed floodlights will provide colored illumination. A. F. Dickerson, Illuminating Engineer of the Exposition, says: "Efficiencies in terms of colored light have been stepped up as much as 100 to 1, and for the first time we are able to mix lights as we do paints and produce theatrical results on large areas at a reasonable cost." The tubes contain a trace of mercury, a small amount of argon for a starter, and a coating of fluorescent powders to produce the color desired. This type of lighting was used at a "preview" on April 30 of part of New York World's Fair.

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